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ComputerWeekly

Thursday, June 9, 1983

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Sperry buys into super chip firm

by Ron Coates
SPERRY last week spent \$42 million for new technology and a 15% stake in Gene Amdahl's start-up company, Trilogy.

Sperry has paid the cash down for an option to license Trilogy's just-released super chip, the first attempt at large scale wafer level fabrication to go into production, and a 15% equity in preferred shares in Trilogy. It will get a seat on the Trilogy board. This gives Amdahl's new firm a market value approaching \$300 million before it has shipped a machine.

Sperry, which normally plays down the technology used in its machines, is being effusive about the potential of the new chip. Sperry chairman Gerald Probst, said that Trilogy's "high speed, ultra-reliable" chip was "years ahead of competing technology and is well suited to Sperry com-

puter products." And he added that it was a major breakthrough in reliability and redundancy. Sperry will manufacture the chips at its new factory in Escondido, California.

The computer giant announced its intention to use the chip in future high performance Sperry machines. But it was left to Gene Amdahl to play down any speculation that Sperry might be moving towards compatibility with IBM.

He said that the deal was consistent with both companies' approach as they "served different market segments", and added that their combined efforts would improve their market entry schedule. Amdahl said that Sperry's endorsement of Trilogy's technology was continuing evidence of its widespread applicability beyond large mainframes. Sperry's present IBM compatible developments.

Trilogy's chip, revealed to the

world at large last week, is 6cm x 6cm, implemented in water-cooled emitter coupled logic, the industry standard semiconductor base for fast computers. It has a one input one output chilled water coolant with a total of 45,000 gates and 1,000 connecting pins per module.

The planned Trilogy computer will contain about 30 of the wafer-sized chips connected by standard 14 layer printed circuit boards. Switching speed within the chip is 300-350 picoseconds as compared to the fastest current serial processor, the Fujitsu 380 (sold by ICL as the Atlas 10) which has a switching speed of 24 nanoseconds.

The dramatic move demonstrates Sperry's determination to stay in the business of making large mainframes. Sperry this week announced the latest in its 1100 family (see page 4).



AMDahl... Showing off the world's biggest chip.

US-French venture to build expert systems

by Philip Hunter

UK EXPERT system developers can expect major competition in the US with the launch of a \$10 million initiative in a joint company to exploit growing demand for knowledge engineering products and services. The company, Teknowledge, has been launched in Monaco by a US company, Framatome, and a Paris-based French company, Sage.

The new company, called Hecht, will probably set up a branch at the end of the year, pending on its early success.

"In concept, the product was building for the next year, with the same orientation as Sage," says Teknowledge president Lee Hecht. The difference, Hecht claims, will be that it will be much better focused in justifying the reasoning behind past decisions made by the computer.

"Ours is the heavy duty industrial market," Hecht adds. "The product will be much more expensive than Sage."

Hecht says that his company, set up in 1981, has already gone a long way to meeting the Japanese goal of developing an intelligent link between man and machine. "We have installed a large Fortran program for gas turbines," says Hecht.

Products of this sort, and for other applications such as design of computer configurations, will be available soon from Framatome, for about \$100,000. Teknowledge and Framatome have also formed a research and development organisation with funding of \$16 million.

System 34 updates worth £200 million

by John Riley

IBM System 34 users intend to spend about £200 million on changing their aging system by next summer and non-IBM suppliers could well snatch part of this market. This is a finding of a survey* of 158 System 34 sites conducted by market researchers Kephon in the UK this spring.

The survey found that 44% of the System 34 users expect to buy a new CPU within a year and a further 32% expect to do so within 2-3 years. By extrapolating these figures to the entire UK System 34 population of 3000, the total upgrading would generate a £200 million market.

According to the survey, System 34 users are at a crossroads with alternative paths in front of them. These are to move to the System 36, to a System 38, or to a 4300 mainframe, to buy in an additional System 34, or to go for a non-IBM mainframe or minicomputer.

The survey was conducted before IBM launched the System 36

Boom forecast for Ferranti

by Kevin Cahill

WITH Plessey's glowing results behind them, City of London analysts have turned their attention to Ferranti. Profits are forecast in the region of £31-£32 million which the company reports its 1982/83 results next week. Keith Hodgkins and John Tyso, the Kephon analysts at brokers L. McEneaney, are suggesting a figure of about £31.5 million, which is over 30% up on last year's reported profit of £23.8 million.

This is marginally better than the £30.5 million forecast by Nick Carter, the electronics industry analyst at brokers Hoedersdon Crosthwaite.

In his newsletter Ferranti, Carter notes that the company has an outstanding international reputation for technology and is a leader in the field of electronics. Over the past few years Ferranti, according to Carter, has developed a management team to match its technical expertise.

He notes that Ferranti is now selling semiconductor devices to both the Japanese and the Americans, control devices to the Ger-

mans and military technology to the whole world.

In each instance Carter is saying that Ferranti has done the work of Newcastle and, in the case of uncommitted logic arrays in particular, Ferranti is variously reckoned to have between 30% and 40% of the entire world market. The company pioneered the concept of customising logic arrays for specific customer requirements at a time when this idea was still very novel. Ferranti now has design centres in the UK, Hong Kong and in the US.

He notes that Ferranti is now selling semiconductor devices to both the Japanese and the Americans, control devices to the Ger-

Acorn challenged on trading methods

by John Kavanagh

AN INVESTIGATION which could have major impact on the way computers are sold through dealers has been launched by the Office of Fair Trading in Acorn Computers. And the UK microcomputer manufacturer says it will fight to the end if the result goes against it.

The Office of Fair Trading is looking into a complaint from an unnamed Scottish supplier to the education and stationery trade, which wanted to buy Acorn BBC microcomputers from a local approved dealer. But the dealer refused to sell to a strongly worded Acorn statement which said the company would not tolerate wholesaling of its products by dealers. "Unauthorized wholesaling will be dealt with severely and may well result in discontinued dealership," Acorn said.

But the Office of Fair Trading is using its powers under the Competition Act, which allows it to investigate business methods which prevent, restrict or distort competition. If it finds against Acorn the company could be ordered by the Monopolies Commission to change the way it sells through dealers.

"And that could hit many other leading microcomputer firms which sell in the same way."

The machine is only sold direct

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TRAMIEL... First in Inmos queue?

Commodore sizes up Inmos purchase

by Kevin Cahill

INMOS, the British Technology Group's brave and expensive effort to give the UK an independent volume chip manufacturer, is under the auctioneer's hammer.

Earlier this week Jack Tramiel, the ebullient founder and executive vice president of Commodore International, and his son flew in to be first in line to buy as the Inmos chairman Malcolm Wilcox looks at every possible solution to secure the company's future.

The Tramiel visit, which Inmos acknowledged was taking place, while refusing to say why, follows rapidly on a recent visit to the US by Wilcox.

The company describes the US visit as routine, but there has been a noticeable quickening in the pace of activity at the chairman's office as the election and the prospect of

Top software men plot against pirates

by John Kavanagh

TOP international government officials are meeting in Geneva this week to agree on a worldwide treaty to kill software piracy. The proposed treaty goes far beyond existing copyright laws to cover not only software copying but also unauthorised use by customers.

The meeting is being run by the World Intellectual Property Organisation, which is supported by governments across the world.

The UK is represented by senior, specialist civil servants from the Department of Trade. And Ronald Robertson, head of the legal department at UK software house CAP and chairman of the Computing Services Association's legal affairs group, is there on behalf of the European CSA.

A measure of the seriousness of software piracy is the fact that senior government people and others such as these are dedicating the entire week to this one topic.

"Software piracy is costing UK services companies millions and the problem is growing," said CSA director-general Douglas Eyskens. "It is especially serious at the micro end. This is a very important conference."

The treaty lays down laws covering the copying and production of "substantially similar" software. And users, too, could find them-

selves in the dock under a clause covering the use of pirated systems. In all cases the original owner of the software would win damages and injunctions against further piracy or use.

Eyskens especially welcomed the fact that the treaty covered users. This meant it would get to the heart of "the real abuse" of copyright, he said.

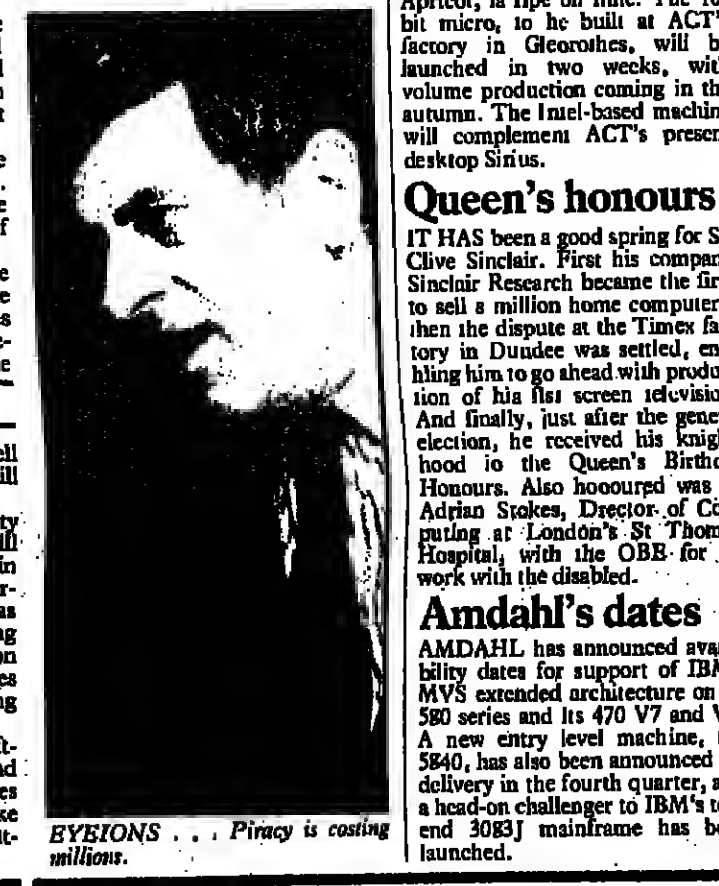
He also stressed the importance of the international nature of the proposed law. "Some companies are reluctant to sell overseas, because of the lack of protection," he said.

Leader comment - page 15.

"They know that if they sell one copy to certain countries it will just get duplicated."

If the officials sign the treaty this week, their governments will be expected to bring in the laws in a set period. This week's conference could thus be as significant as the Council of Europe meeting which agreed on a data protection treaty. That committed countries including the UK to introducing data privacy laws.

Laws specifically covering software copyright would put an end to years of work by the services industry and some MPs to make existing rules relevant to computing.



IBM takes a stake in telecomms maker

by Howard Karter

IBM LAST week agreed to buy 15% of Rolm Corporation, a Santa Clara, California manufacturer of telecommunications equipment such as PBXs and switches. The move comes shortly after IBM took a stake in Mitel Corp, which also makes PBXs.

IBM will spend \$28 million to buy approximately 33.8 million newly-issued shares of Rolm stock, and will be limited by agreement with Rolm to a maximum 30% ownership.

In addition, the purchase will get IBM two nominations to

Rolm's board of directors.

US industry observers have long predicted the coming of a head-to-head battle between IBM and communications giant AT&T, and that speculation has picked up considerably in the past 18 months with the settlement of both the AT&T and IBM antitrust suits.

It is widely rumoured here that AT&T is preparing to launch a microcomputer, perhaps one based on AT&T's Unix operating system.

Moreover, IBM has frequently been regarded as perhaps having missed several good marketing op-

portunities in the office automation area, despite the market inroads the IBM PC and PC XT micros have made. The pact with Rolm may plug this gap for IBM.

In New York, Dan Mandresh, an analyst for the Wall St firm Merrill Lynch Pierce Fener and Smith, Inc, is reported to have said of the deal, "IBM won't be re-

strained by the 'not invented here' syndrome."

Rolm is a major supplier of military telecommunications and has over 5,000 general purpose military computers installed worldwide.

The company is currently pursuing a £66 million suit, launched earlier this year, against Plessey.

Rolm alleges breach of copyright by Plessey, claiming that the UK company based its IDX exchanges on Rolm's CBX.

Plessey denies the charges and has launched a counter-suit in the US. A seven-year agreement between the two companies ended in mid-February of this year.

The California company earlier this month claimed a significant lead with its Ada compiler, which it is developing in partnership with mini-maker Data General.

Figures make software buyers happy 3

Which micro operating system? 18/19

Club Med teaches holidaymakers 17

Company News	10
Software File	11
Micro News	12
Platform, Downtime	13
Letters, Leaders	14
Learn about computers	15
In the sun	17
Which micro operating system?	18/19
Workplaces	20
Honeywell's Long future	23
Compu North preview	24/25, 34/35
People	27
Products	29, 37/39
Jobs	42/79
Northern Jobs	72
Top Jobs	43

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BROAD... Welcomes the initiative.

NEDO tries to stop tariff trouble

by John Riley
NEDO this week started a fresh attempt to sort out Euro-tariff barriers to UK micro and component makers.

A working party has been set up by the Electronics Economic Development Committee (BEDC) of the National Economic Development Office (NEDO) to reconcile two opposing proposed solutions.

UK semiconductor manufacturers are protected by the EEC import tariff of 17%, as are printed circuit board manufacturers by the 8.6% import duty on bare PCBs and the 8.1% duty on PCBs printed with passive components.

They are both unhappy about the concession to computer manufacturers of only a 5% duty on sub-assemblies - PCBs with active devices such as semiconductors on them.

The PCB manufacturers believe this situation deprives them

of opportunities to manufacture PCBs and add value to them, while the semiconductor manufacturers believe the sub-assembly route is a way round the 17% duty.

Both parties are pushing for an increase of the sub-assembly tariffs from 5% to 17% when semiconductor account for over half their total value.

On the other side, the microcomputer manufacturers want the tariff on imported semiconductor devices to be reduced so that they can reduce costs.

The Department of Industry has put forward a compromise proposal that the duty rate on semiconductor devices should be reduced from 17% to 11%, and asked the BEDC to work out a policy that would unite the two sides so that an agreed British approach can be made to the EEC to get the anomalies removed.

"We welcome the initiative," says David Broad, chairman of the

British Microcomputer Manufacturers Association, who is on the working party chaired by Professor John Ashworth, the next day man of the NCC.

"We hope it will draw attention to the plight of British manufacturers. We want low duty rates to imported components to maintain competition and the BMAAG will continue the political lobby for us."

NEDO hopes to complete the report quickly this summer so that a submission can be made soon to the EEC. However, the report will have a long way to go.

It will be incorporated into the DoI submission to the EEC. The commission will send it to other EEC countries for their views, and then back to the EEC standing committee on trade in Brussels for a community view. It would then go to GATT (General Agreement in Tariffs and Trade) negotiations in Geneva to be discussed.

Asian spies cause French shutdown

by Jack Gee
INDUSTRIAL spies from South-East Asia are believed to have carried out the theft of vital computer components for operating a robot which has forced a French manufacturer of high-fidelity loudspeakers to shut down, making 120 workers temporarily unemployed.

A set of eight circuit boards were stolen from a factory near Brest, Brittany, while it was closed for the weekend.

The thieves left a safe containing a big sum in cash untouched.

But they sorted through a dozen boards before vanishing with eight specially designed for the firm of Jean Cabasse.

The manufacturer drew attention to his technology at the recent international hi-fi exhibition in Paris by presenting the robot system, the only one in the world used for making loudspeakers.

France's counter espionage police force, the DST claims that it is already on the trail of the thieves

and has traced them to Taiwan.

A man claiming to be phoning from Taiwan called the manufacturer's wife, saying he knew how to recover the missing circuit boards. As proof that his offer was genuine, he gave his phone number in Taipei - and Madame Cabasse phoned him back in the presence of DST officers.

"The caller told us he worked in the computer industry and had himself been the victim of industrial espionage," said Cabasse. "He said he had identified the

thieves and could probably recover the cards. But they would probably demand a huge ransom."

DST agents said the thieves were obviously specialists because they knew exactly which cards to remove from the computer.

Cabasse said: "It is unlikely that we will agree to pay cash to recover the cards. It will take two months for me to have new cards made. Meanwhile my staff have had to be laid off and I have lost huge orders. But I will not give in to blackmail or espionage."

Production problems hit Kilostream users

by Donald Kennett
TEETHING troubles on GEC-Marconi's production lines are causing delays to customers for British Telecom's Kilostream digital leased line service.

Kilostream started in January, making a range of digital circuits available with speeds from 2.4Kbits-per-second to 64Kbps.

The schedule announced in March was to have the service available from 250 centres by the end of the year and a BT spokesman said that his company still expected to meet that target.

"But it is certainly true that availability is not as wide as we had hoped it would be at this time," he said. He declined to confirm reports that 50 customers had been connected and 150 were waiting, on the grounds that this information was commercially sensitive.

A Marconi spokesman admitted

that the supply of codes and multiplexers needed to implement the service had fallen behind, he added: "Now that the problems are over, we expect to catch up. Liberalisation has increased demand about threefold and it has just been gearing up to suit everybody that has been the difficulty."

The company had been supplying the devices over a period of time already, he said. It had spent a lot of money on setting things up, but had experienced teething problems.

"It's high technology and it's new technology," he said.

The new technology involved an automatic component inspection and wire wrapping machinery. "It's new to this company and it's brand new equipment," the spokesman said.

CTL momentum grows

by Philip Hunter
COMPUTER Technology (CTL) will tomorrow extend its fault-resistant hardware, the Momentum Range, into the super micro field and boost its top end offerings.

Existing models have at the same time been upgraded to make their place in what will be the 9000 series.

The larger new model offers power equivalent to a small mainframe, and will challenge Tandem and others in the top end of the market for front end processors to large banking systems, as well as stand-alone transaction processing systems with varying degrees of resistance to hardware failure.

At the bottom end of the new

Momentum range is a machine that can almost claim to be a resilient micro. "It definitely comes into the super micro league," says a spokesman.

CTL's fault-tolerance is based on software, and can be built up in stages from the basic 9000 computer. Tandem's solution is hardware-based, with closely coupled processors using a common set of links.

The first phase of resilience available from CTL is a fast recovery option capable of returning a database to a clean and consistent state. The second is a mirror disc option, and the third, to give full resilience, is a link between two processors.

Top software houses enjoy Euro sales boom

by George Black

LEADING international software houses are booming - sales of applications systems for smaller IBM machines alone would grow from \$360 million to \$2,550 million in western Europe by 1987.

Three of the market pacemakers published annual financial results this week. Biggest of the trio was the French Cap Gemini-Sogefi, which increased its revenue by almost a quarter last year.

This was, however, the slowest growth of the three, with profits up only 5%. CGS income is now over one billion Francs (£100 million), according to a report from chairman Serge Kampf in Paris.

The US database expert Cullinet Software announced a rise of 59% to \$781.4 million, compared with \$494.4 million for the previous year. And the British computer group, Business Intelligence Services (BIS), chiefly famous for the success of its Midas banking system, saw its turnover go up by more than 60% to £23 million, with a startling jump in profits by 95% to almost £2.7 million.

The American software market

is by far the largest in the world and is dominated by American companies, although British and French firms such as BIS are beginning to make significant inroads there. BIS managing director Roger Graham attributed his firm's outstanding year to higher overseas sales, particularly to the US, coupled with a helpfully weak pound against other international currencies.

In Europe it is undoubtedly the French who continue to reign. Their software firms netted 11.4 billion francs in 1982, up 22% on 1981, with nearly a fifth of that coming from exports, according to French official figures.

But some UK observers say that those statistics may be misleading. The French have five of the top 10 European software houses, but this may present a brighter picture for them than is strictly accurate.

As British Computing Services Association director-general Doug Belyons commented: "They include the output of some nationalised firms and banking subsidiaries, which we do not. And some British firms like Logica and CAP count their overseas branches as earning money for

their domestic economies rather than contributing to our exports."

French figures indicate that they have more than 100 software firms - but the number of independent ones is fewer than 50 and activity is centred on a few giants.

Britain, at present Europe's number two, has about 200 smaller concerns specialising in software. Our best performer - under the French definition at least - is the BP subsidiary Scicon, which comes third in their list (topped, of course, by IBM's European offshoot).

Italy has about 250, mostly still very small, software firms. And West Germany, though predicted to be the biggest market for selling programs to by the end of the decade, has so far gained only a tiny share.

France's software firms have doubled their staff in the past six years in spite of the recession to over 40,000. The growth has been

boosted by the worldwide success of Transpac, the public packet-switched network designed by SESA and Teletel.

CGS is a major component of the French success, with more than 4,000 employees, 820 of whom work in the US. By 1989 the group hopes for a turnover above five billion francs from a workforce of 8,000.

IBM systems houses can look forward to a special bonanza, according to researcher IDC. Its findings follow IBM's launch of a new joint marketing and hardware discount scheme for software houses to boost sales of small machines.

IDC reports that users of smaller machines account for 19% of the \$1,900 now spent on software and services by IBM sites. But by 1987 they will make up as much as 39% of that budget - bringing an extra boom for those providing the software.



GRAHAM... Outstanding year due to overseas sales.

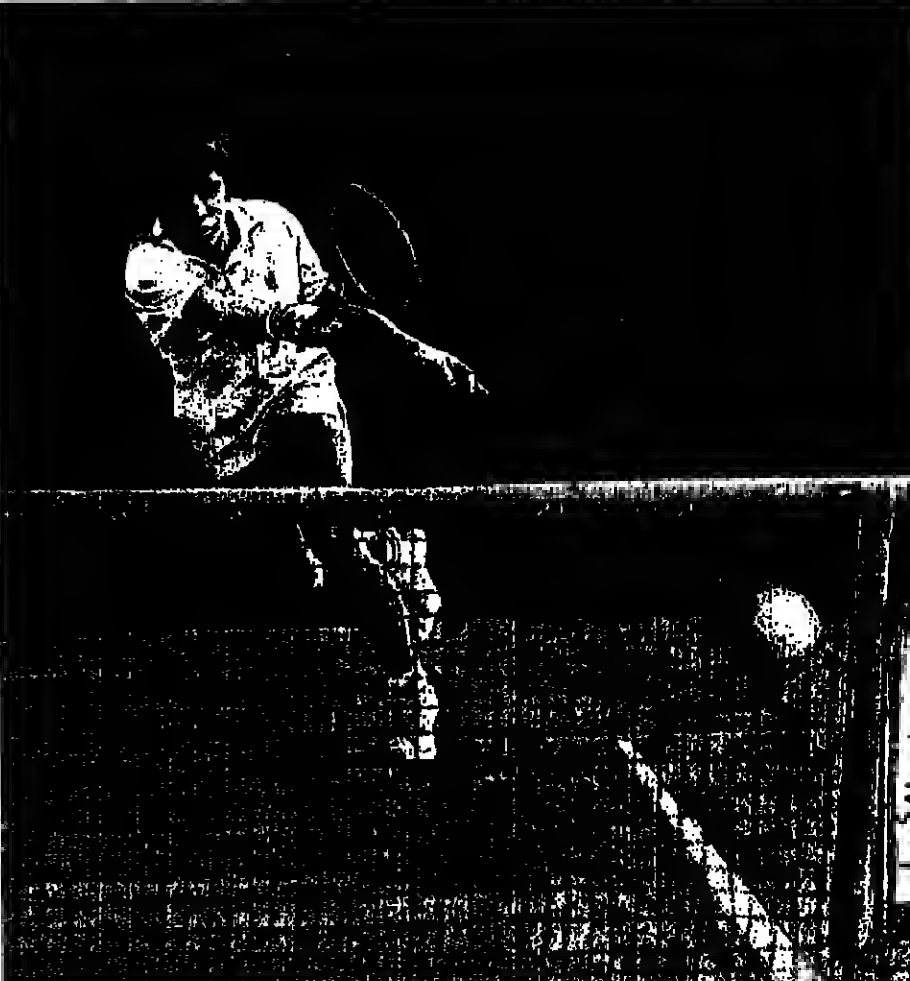
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Welcome booklet misses VDU point

by John Riley
KEY issues relating to VDU safety are not mentioned in an influential Health and Safety Executive booklet published this week, others are glossed over, and it is out of date.

That is the view of Brian Pearce, of Loughborough University's Human Sciences and Advanced Technology Research Group (Husat).

Pearce runs a popular seminar on VDU safety which are widely attended by industry.

"The booklet doesn't mention the allegations of links between VDUs and foetal abnormalities in pregnancy, for example," he commented.

Pearce believes that there is insufficient evidence for any links but that the report should have allayed fears which have been widely publicised in the British and especially Canadian press.

The booklet is in two parts. The first examines possible health effects associated with VDU use and draws attention to reports of cataracts, photokeratitis, epilepsy, facial dermatitis and general radiation emissions from VDUs.

It concludes that radiation levels are below existing national and international standards, that photokeratitis is rare (between one in 5,000 and one in 10,000), and that there is no firm evidence regarding cataracts and dermatitis.

The second part of the booklet provides an overview on points relating to the introduction of VDUs, and covers workplace design, personal factors, planning, communication, and VDU ergonomics.

Pearce applauds the belated appearance of the booklet, but believes it doesn't scratch deeply enough in some areas to have the influence it deserves.

"It is a much needed work which will provide much needed

guidance. "It is a difficult subject to write about, but it needs more emphasis on the economic advantages of incorporating ergonomics to persuade hard-headed DP managers that ergonomics are beneficial."

Other points that Pearce thinks are inadequately discussed include how eyesight screening should be carried out, and whose responsibility it should be, and the importance of job design.

"The job design is most important," he said. "If that is all right then you don't need to have rest pauses."

Another fear that the booklet should have allayed, according to Pearce, is that VDUs might emit more radiation as they become older and more inefficient.

The three year delay in producing the booklet means that the Health and Safety Executive is five years behind, thinks Pearce, as union guidelines have appeared since 1978 which serve to cloud the issue.

"The union documents oversimplify the often complex issues and state numerical values for certain parameters in an attempt to give numbers for negotiations. But they get their numbers and concepts confused, with bizarre results," he said.

Nevertheless, Pearce believes that the booklet will be generally well received.

"The unions will be upset about eyesight screening and the absence of references to visual screening. "It won't be seen as suggesting standards prohibitive to manufacturers and is better than the German approach," Pearce commented.

Visual Display Units: Health & Safety Executive, HMSO, £5.



VDUs... New report doesn't go far enough.

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Luton link lifts General Motors

by Donald Kennett
GENERAL Motors' plant in Luton has been linked into a corporate office automation system in Detroit that has already brought the company some spectacular savings.

The system was described at last week's Office Automation Show-Conference in London by the company's office systems manager Michael Flynn who said that it had paid for itself in 13 months.

He emphasised that the most important stages of installing office automation were the planning stages and that improving efficiency was no good unless people did something useful with the time that was saved.

"What we have in it is either make the organisation more effective, or we make our products more effective," he said. The system has been used to do both.

Based on an Ethernet local area network with Xerox personal computers and word processors, the system is initially being used by "environmental activities staff," who monitor the requirements of pollution regulations and certify the performance of company products.

"Our product is voluminous text," Flynn said. "We interface with government and it's nothing for us to produce a 500 page report on acid rain or some similar problem."

Improving the productivity of the management and technical staff working on these reports has enabled them to tackle a task they would not otherwise have attempted. That was to develop a counter-proposal to the way in which the State of Illinois planned to implement a federal law on pollution.

The state plan would have cost the company about £500,000 a year, while developing the counter-proposal would have cost the company £600,000 using pre-automation methods. The actual result was a first-year saving of £300,000.

Another important saving Flynn cited concerned the annual update of the company's worldwide vehicle reference manual.

The time had been cut from 60 to three days because of the ease with which the work of people in widely dispersed departments could be co-ordinated. The effort had been cut from 22 man-months to four and people could respond in queries in minutes instead of up to eight hours.

Planning for the system started late in 1980 and installation started at the beginning of last year, with the first phase costing £735,000. The number of personal computers on the system had reached 130 and was going to be 160 by the end of next month, but the number of word processors had shrunk from 32 last summer to eight now.

Initially the system was used for document preparation and message passing. But the company

wants to add archiving and electronic cataloguing and manual publishing. It is evaluating a Digital Equipment Vax based system for filing and retrieval, and is talking to Rolm, Mtel and Intercom about a digital PBX to marry to its local area network for external communications.

In designing the system, Flynn's team involved as many as possible of the people who were going to use it, which meant consulting more than 100 people in all. When it came to implementing it, the company decided to make its use voluntary, but allowed for peer pressure to take effect.

For example, people who dictated their text got the output back on floppy disc. One middle manager (the most difficult group to sell the system to) who complained about using the system had his terminal taken away. He later reported that he was outside of the information flows in his department because none of his subordinates wanted to give him hard copy of information that was on the system.

At the purchasing stage, Flynn said the company contacted 10 equipment vendors and sent them a 45-page specification of what the ideal system would be able to do. Five of them made no response at all, two said thank you for thinking we could respond but we cannot and three made proposals for partial solutions.



WGBREIT... No deals yet.

Convergent moves into mini business

by Robert Parry
CONVERGENT Technologies is moving into the mini business. Its new MegaFrame, an expandable system designed around the Motorola 68000 processor, is aimed to take business from the supermini and small mainframes markets.

And like Convergent's present product line, MegaFrame will be taken on by mainstream computer companies on an OEM basis. It has already been shown in the US by Gould, in the PowerStation guise, and Convergent's major customers Burroughs and NCR are expected to sign up for the machine soon.

"We have purchase orders from two dozen customers, and expect another two dozen in the next couple of months," says Ben Wegbreit, general manager of Convergent's data systems division. These orders range from ones and twos to hundreds of units. First shipments will be in August.

Wegbreit confirms that Convergent is talking to NCR and Burroughs, but maintains there are no deals yet. "We are working on it. A Burroughs spokesman adds that it is interested in the whole of

Convergent's range of products, but has no specific plans yet for the MegaFrame.

The MegaFrame was designed as a flexible architecture to stretch from an eight-user system for around £20,000 to a 36-processor machine, with the processors working in parallel on a 32-bit bus, supporting 128 users.

It is thought of as a micro because the chips are small," says Wegbreit. "But its processing power puts it well into the mainframe range."

From the start it was designed for the forthcoming 68020 32-bit processor, but for the moment uses the 68000. Wegbreit reckons Convergent will be the first company to ship products using the 68020, and that by then will be using 256K dynamic RAMs too.

The present 8086-based workstations can act as super-intelligent terminals to MegaFrame, which can also support dumb terminals plus Convergent's new programmable terminals, also 8086-based.

And its portable micro, the Ultra, will have the ability to connect to MegaFrame. Ultra will appear at the end of the year, says Wegbreit.

SALES BRIEF Wang wins contract in Australia

WANG has won a \$70 million contract to automate the office of Australia's Department of Social Security. The contract is the largest ever office automation contract down under, and includes 7,000 workstations to be linked to a national network. The company will also provide 400 computers spanning the entire V8 range from the 16-bit VS 25 to the 32-bit VS 100.

MoD chooses

ANOTHER big contract, worth £1 million, has come Pearson's way from the Ministry of Defence just as the company is about to report record £30 million profits and the opening of a new factory. The contract is for a computer-based Radar Procedures Group Trainer to help the Royal Navy train its men in use of airborne radar.

Shefra typesets

PUBLISHING baron Robert Maxwell has spent another £500,000 with UK distributor Shefra Graphics for a real time system to extend the computer typesetting capabilities at his European Printing Corporation in Dublin. The company already has one similar system and is preparing to install an Image Composition system for full page make-up online.

Car dealers buy

THREE more car dealers have installed the Kerridge Autolink package, which is based on Wang computers, to keep track of spare parts and run payroll. The success follows a recent £2 million order from the Toyota dealer in Saudi Arabia.

Graphics top £2m

WELSH graphics specialist Data Type has now topped the £2 million mark for sales of the graphics option to its TeleVideo terminals. Three-quarters of the sales have been abroad, and production at the new factory in Gwent is now running at 200 a month.

In the Future

FUTURE Technology Systems, the fast growing Scottish builder of business micro packages, has selected the CP/M operating system from Digital Research for its Series 88 16-bit machines. FTS has lodged a £55,000 contract for the supply of Digital's products, including CP/M and MP/M operating systems and CP/M graphics.

BP buys Philips

BP OIL has opted for three Philips Maestro Systems worth £330,000 to improve productivity of its programmers and analysts at the north London administrative headquarters. The equipment includes 72 workstations to give instant access to documentation, as well as word processing and an electronic diary.

Menswear deal

DATA General OEM Pennine Computer Systems has just installed a retailing computer set-up for a 220-branch national chain of men's clothing shops. The central computer, a Data General 16-bit Eclipse, is based at the Leeds head office of Greenwoods Menswear, with Kimball Tag readers for automatic updating of stock and sales details in the branches.

Oil package

SCICON has sold a package of Fortran programs to an Irish company for optimising the refining of crude oil. The Irish Refining Company of Cork has bought Scicon's MINILinear programming package to select the cheapest production methods that produce the required amounts of each type of petroleum from the original crude.

Systems house puts Ada in perspective

by George Black
A LEADING British systems house is trying to pre-empt the Ada language project with a set of software tools available over two years earlier.

Systems Designers of Fleet has already installed its Perspective tools - promised in last year's annual report - at three UK sites, including British Aerospace, and it has orders for a further six.

BA's information technology manager said it had opted for the SDL product in preference to the Californian Telesoft's Pascal system or its Ada environment. It will use the software in collaboration with a German and an Italian company on the design of a new aircraft.

SDL plans to work with at least one British university on the use of Perspective, which could prove to be one of the cornerstones in the national Alvey programme for "fifth generation" computer technology. Technical director Geoff Holmes said it would be happy to provide the product into the Alvey pool.

Perspective is the outcome of 25 man-years of work, backed by £10,000 from the National Computing Centre's software products scheme and the Industry Department through the British Technology Group.

It consists of a set of tools to reduce the cost of developing advanced software applications in the telecommunications and control engineering fields. It operates on the Ada principle of source code hosted on a DEC Vax supermini with machine code being downloaded to micros based on



JACKSON... Starting point for Alvey.

either the Intel 8086, Motorola 68000 or Zilog Z8000 chips.

Project manager Ken Jackson, who was involved at the Defence Ministry in the design of MAS-COT and in trials of Software Sciences' SDS toolsets, claimed Perspective was much the most active database controller on the market.

"It's a good starting point for the Alvey programme and does a lot of things the directors will be interested in," he said. A major problem in the realtime applications industry has been lack of trained staff, which creates an urgent need for productivity aids. The US Defence Department plans to enforce the use of standardised Ada from 1985, but commercial concerns are growing impatient as the backlog mounts (see Software File, page 11).

Perspective incorporates many Ada principles and extends the current real time standard Pascal. SDL international sales manager Elwyn Wareham insisted it would not be superseded, even when Ada at last becomes universally accepted.

Meanwhile SDL ploughs ahead with its input to Ada via the Ada Group Ltd consortium and proposals to the EEC Esprit committee.

Customers fume with Intelligence

by Claire Guonding
USERS of the popular financial modelling package, MicroModeller, are up in arms against supplier Intelligence UK. The committee of the user association is advising its members - including big names such as Shell, BP, and Trusthouse Forte - not to renew subscriptions to the support and update service because updates have not been carried out as promised.

They say that under the SUS agreement they are paying £200 a year each for three updates a year, plus a hotline help service to users and a quarterly magazine. It is alleged that Intelligence UK has received more than £200,000 for support, not all from user association members. The newsletter has appeared only once.

User association chairman Philip Morris said: "The main reason for our existence is that the

product should continue to be enhanced. There are a lot of other packages on the market now, including Micro FCS from EPS Consultants and the product from Ferrox, so I'm anxious to protect our investment in MicroModeller. It's in our interest to keep it the number one package."

The group is evaluating Modeller 16, Intelligence's new alternative to MicroModeller and the system supplied through Dataflex for the US Ferrox. Intelligence's problems stem from its acrimonious break with Ferrox, original supplier of the modelling package, and with Dataflex, which was established by ex-Intelligence staff.

Intelligence enhanced the Ferrox original with an implementation for the lucrative CP/M market and is the owner of the MicroModeller name. Ferrox receives only small royalties from Intelligence's

successful sales of MicroModeller. The three-year agreement between the two firms runs out in December and Intelligence is anxious to gain its independence through its efforts on the new 16-bit version.

Ferrox president Richard Hykes said: "Intelligence has lost its exclusive rights to our product and won't receive any more updates from us."

Intelligence has lost key staff men to Dataflex including David Low, Phil Benge and Terry Thompson.

Intelligence managing director Ashley Ward said: "Only 70 to 80 of the user association have the support service and we have reduced the cost by paying their membership fee for them. The criticism is not fair, because they have been expecting a scale of service they simply haven't paid for."



WARD... Managing director of supplier Intelligence UK.

Honeywell pushes mini market links with IBM

by John Kavanagh
HONEYWELL is pushing its links with IBM in the mini market. A new release of the operating system enables users to slot Honeywell's DPS6 mini more readily into networks using IBM's SNA network architecture.

At the same time, the release includes links into Honeywell's own DSA network architecture, plus new features aimed at end users with no computing experience.

Honeywell says release three of the GCOS Mod 400 operating system is "the biggest-ever extension of DPS6 capability".

On the SNA front, there is a file transmission facility, said to be the first from any non-IBM manufacturer. It enables data and text files to be passed from an IBM host computer to DPS6 satellite.

A document transfer facility handles the transmission of documents through Honeywell's DSA and IBM's SNA from the Honeywell OAS office automation system running on a DPS6.

New for end users is a range of menu-driven features and help facilities plus Honeywell's own financial modelling package, Info-

calc. This system can be used with the office automation system word processing facilities to produce management reports from models. Other new features include a Pascal compiler, which conforms to International Standards Organisation specifications, plus links between the office automation system electronic mail utility and DSA. This means office automation users can access data processing files and systems, for example to incorporate master file data in documents.

With the new release Honeywell has confirmed the introduction of a query language, foreshadowed last autumn. This language is part of the DPS6 data management system. Honeywell says this system's database manager, transaction processor and query language are comparable with similar products running on its mainframes.

Honeywell says the announcement gives users a "software platform for the 'eighties'".

A further bid to boost the company's network architecture is coming later this month with the launch of a Honeywell microcomputer which will fit into DSA.

Database dream nears fruition

by Donald Kennett
THREE Californian innovators are hoping to realise a 10-year-old dream of community computing this year.

Osborne 1 designer Lee Felsenstein, with friends Ken Kolstad and Hiram Lipkin, seven full-time staff and a circle of part-time helpers have been developing a coin-operated database system that will enable inter-linked community databases to be accessed and contributed to from terminals in places such as libraries, bookstores and community centres.

A public trial based on a donated IBM machine met an enthusiastic response when it ran 10 years ago, but the organisers found that maintenance costs made con-

tinuation difficult and expansion out of the question. Falling hardware costs and increased system reliability have encouraged the group to try again.

In the meantime Community Memory Project, as the group is called, has developed the software - Sequitur and X-dot - to run the database and to provide error-free links between community-based processors.

CMP is a non-profit organisation and the commercial sale of the software through its associated company Pacific Software Manufacturing is described as a spin-off activity. But it does make a significant contribution to keeping the Project going. Other funds are donated by members of the computer industry, including

Felsenstein who still works full-time for Osborne.

Project member Marcy Darnovsky said last week that technical development of the public terminal part of the system should be completed in the next two or three months and implementation will depend on the success of fund-raising activities being conducted at the same time.

The first system is expected to go into a San Francisco neighbourhood group centre.

"We are hoping that the community it serves will take the initiative in raising the funds," Darnovsky said. "But the system provides access to technology for those who wouldn't otherwise have it and lots of foundations are interested in funding facilities."

Dynabyte tries to fire UK

by Philip Hunter
US MAKER of business micros Dynabyte is trying to ignite its UK market.

It is signing on distributor Key Computers to build a complete package of support and software. The package is based on Dynabyte's eight and 16-bit Monarch micro launched in Europe in February 1983, and includes a year's free maintenance, provided by Systems Reliability.

Two software companies are also involved: with business and financial accounting programs from MP&L and Larknet included in the package.

The final end user price is high at about £32,000 for the support, software, a Monarch micro, Tally printer, and the realistic maximum of eight I/O terminals. This puts it in the price range of the cheaper minicomputer systems as supplied by companies like Digital Equipment, Data General and Wang.



WOODS... Customers happy to pay fair price.

But Key managing director Roger Woods says that special support, which includes an account of the computer to enable users to contact the author of software to sort out problems, will attract small companies. "Customers are happy to pay a fair price for support," he says.

Key is committed to take 100 Monarch computers in the first year, and is looking for 12 UK distributors to sell them.

With more than 12 distributors, says Woods, it becomes difficult to coordinate good support and good maintenance.

France boosts its schools scheme

by Jack Gee

FRANCE has given its school computer programme a major boost with an order for immediate delivery of 1,000 Thomson-CSF TO-7 family micros with a further 2,000 in the autumn and 3,000 in January 1984 from the same firm.

Daniel Gros, top adviser at the Ministry of Education, said: "The government wants 20,000 microcomputers in the classrooms over the next few months and 100,000 will be installed by the end of the ninth national economic plan in 1988. The target for the end of the current year is 10,000."

Ministry of Education orders are providing a new, vigorous incentive for France's lagging microcomputer industry. They have helped Bull's subsidiary R2E RPT R2B to extend its product range and enabled selling Logabex to survive thanks to a contract for 2,400 machines.

specialises in electronic equipment for laboratories and industry, says that education ministry orders for its microcomputers now account for 30% of its 60 million franc turnover.

Chairman Bernard Premier says: "We now expect 30% growth in 1983. The school market has served as a showcase for our products and helped us to profit from economies of scale and to set up a more efficient marketing network."

The French government plans to spend 1.5 billion francs (120 million sterling) on computers for elementary and secondary schools over the next five years without including orders for universities, technical colleges and training establishments.

The Matra Group, in which the state now has a controlling share, is developing a range of educational software packages, designed by leading French publishers.

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صحة العقل

Scicon pushes into robust networks

by Claire Gooding
A SMALL UK company is linking up with BP-owned giant Scicon to make a joint assault on the world market for robust networking systems.

Beale Electronics of Windsor is developing Hlan, a high integrity networking system using fibre optics which, unlike Ethernet, will be able to cope with the dust, noise and heat of the average industrial environment.

Scicon is to sell the Hlan system worldwide for Beale, and has established that the product will bring in £300 to £400 million over the next three years.

The lack of a robust and totally reliable system is what has held back most of the major potential industrial users of networks.

"The whole industry has been looking for a way of tying together process computers in plants," explained Nick Beale, managing director of Beale Electronics. "The objectives are very different from



A chemical plant — and the sort of site where Ethernet cannot work, and Hlan will.

Ethernet and we do not see ourselves as a competitor. In fact we realise that marketing is important: that's why we're selling this on the back of Ethernet."

Scicon International is to fund the development of software and hardware for the network.

The specifications to which Beale will work are rigorous: Hlan will use fibre optics rather than standard Ethernet cable, but im-

plemented in such a way that users will be able to retain all their existing Ethernet software. As this is likely to represent a very large user base by the time Hlan is released in 1984, the system will have a significant advantage over non-Ethernet compatible systems.

Hlan must be able to recover completely from any crash, must guarantee a response within milliseconds, and must be able to

work to a potentially explosive atmosphere. It will keep going even if a cable breaks or one of the machines on the network goes up in flames. It therefore promises to be far more reliable than Ethernet, which cannot tolerate the conditions to be found in most manufacturing plants, warehouses and factories. Ironically these are exactly the places where a networking facility is often badly needed.

Unions link to spread the IT message

by John Riley
TMB Civil Service unions have banded together to teach their members information technology. A series of five-day courses to instruct permanent union officials in the implications of new technology started last week, and the officials will be expected to pass on their new knowledge to members.

"This style of education is common in Scandinavia," said Barry Reamsbottom, the Civil and Public Services Association's head of education, but it hasn't been tried on any scale in the UK. We have been strong in training shop stewards but not in getting the information through to members."

The Council of Civil Service Unions is co-ordinating the programme, but three unions are particularly active. These are the Society of Civil and Public Servants (mainly executive officers), the CPSA (clerical officers), and the Civil Service Union (messengers etc.).

The catalyst for the awareness campaign was the scrapping last year of a national Civil Service new technology agreement which was rejected by the CPSA and the SCPS. Those two unions insist that agreements include two principles: a reduced working week with the introduction of new technology, and a clause guaranteeing no job loss. They rejected the compromise agreement that there would be no redundancies (as distinct from no job loss) because of new technology.

The result of the failure to agree was a policy statement issued recently by the CCSU which affirms that there is now no possibility of a

national agreement and that each Civil Service department will have to negotiate its own new technology agreement.

This has sharpened the movement towards education, and there is now more urgency to devote it down through the structure of the unions," said Reamsbottom.

Initially about 180 officials are taking part in five-day courses at the eight trade union study centres for shop steward training, which have been built up by the TUC over the past decade. A larger batch of courses is scheduled for the autumn.

Unions have had problems getting agreements in government departments, according to Reamsbottom. "In several cases we have been close to getting departmental agreements, for example with the DHSS and the Department of Transport, but last December the Treasury intervened and instructed departments not to enter agreements on the basis of no overall job loss clauses," he said.

Reamsbottom says that only five new technology agreements — which affirm the intention not to lose jobs but to provide a better service for the public — have been made to date, and these have been for projects within departments which are limited in scope.

They include a pilot scheme for positions at the Department of Education and Science at Duxford, the use of microprocessors in check files at the Passport Office, Scottish Courts administration, payroll in the Home Office and general cataloguing in the British Library.

Boy 14 teaches adults in software design

by Tom MacSweeney

FOURTEEN-year-old Mark Lande, of Presentation Brothers College, Cork, has been described as "brilliant beyond his years" for his overall victory in the Memory Ireland Computer competition for Irish schools.

He produced a program designed to show how computers can be applied to teach Morse code, particularly for those learning radio transmission.

Lande is a third-year student in secondary school and is already proficient in Basic. He is learning Pascal and has a thorough knowledge of the 6502 assembly language.

At school he has worked on a variety of computers, but is most proficient on the Commodore Vic-20 and Commodore 64 machines.

IBM wins court veto

by Howard Karten

IBM has won a preliminary round in its fight to keep Cybernet Corp. of San Jose, California, from transferring to third parties expertise which Cybernet allegedly took illegally from IBM.

The ex-IBM staff who recently started Cybernet stole IBM thin film technology to do so, IBM alleges. Cybernet recently licensed two California firms, Computer and Communications Technology Corp. of Santa Barbara, and National Microelectronics of San Diego, to use its technology.

STC opens orders by phone system

by Donald Kennatt

COMPONENT distributor STC Electronic Services is the first to open its order entry system to dial-up access by its customers with new software.

Front-end software, which provides a dialogue suitable for first-time users and which supports asynchronous terminals, has been implemented alongside the company's existing components database on its Honeywell 6600 DPS mainframe. This makes it the first major distributor to offer electronic ordering facilities to non-dedicated terminals, according to general manager Brian Murdoch.

Any of the company's 6,000 account customers that own or is prepared to obtain an asynchronous terminal and a modem or acoustic coupler can dial into the system, get quotations and delivery times, and place an order for same day despatch. Any casual purchaser with a credit card and a terminal can use it too.

The system also allows STC's rivals to check out its stock levels and re-ordering schedules, although Murdoch is confident that the benefits of the system will far outweigh this disadvantage.

"We are after a bigger share of the market," he said. "Even a 1% increase would be significant to us."

STC is the UK's largest distributor and holds 15% of the market. It sells 40,000 products from transistors and passive components to £20,000 computers.

The company was first dedicated to synchronous terminals rather than the asynchronous type dedicated to the one service because of the cost that

would have been involved, either for STC or for its customers, of installing them everywhere they might be wanted.

Synchronous terminals support on-screen forms and other facilities that make a system simple, quick and reliable to use. They become economic particularly where an online system is in constant use or where the business being conducted has a consistently high value — neither of which applies to component purchasing.

Viewdata was also rejected as involving expensive terminals of a type not routinely found on customers' premises. The fact that Freitel's gateway to external computers was not yet available throughout the Prestel network also meant that there was no saving to be made on telephone call charges.

Developing the new system had cost £30,000, mostly for designing and implementing the user interface.

Outside calls come into one of three groups of telephone lines — one for each of the three transmission speeds handled — and are handled by software which is just one of 70 applications using the company database. The database is accessed from 152 asynchronous terminals in-house, 40 of which are for entering component sales.

Viewdata has been chosen as the medium through which Llanelli Radiators will keep its customers and suppliers informed of its stock levels. The company's aim, like STC's, is to increase its market penetration. The viewdata software it will use is being supplied by Debechams Interactive Systems.



MURDOCH... "After a bigger share of the market."

STC opens orders by phone system

by Donald Kennatt

COMPONENT distributor STC Electronic Services is the first to open its order entry system to dial-up access by its customers with new software.

Front-end software, which provides a dialogue suitable for first-time users and which supports asynchronous terminals, has been implemented alongside the company's existing components database on its Honeywell 6600 DPS mainframe. This makes it the first major distributor to offer electronic ordering facilities to non-dedicated terminals, according to general manager Brian Murdoch.

Any of the company's 6,000 account customers that own or is prepared to obtain an asynchronous terminal and a modem or acoustic coupler can dial into the system, get quotations and delivery times, and place an order for same day despatch. Any casual purchaser with a credit card and a terminal can use it too.

The system also allows STC's rivals to check out its stock levels and re-ordering schedules, although Murdoch is confident that the benefits of the system will far outweigh this disadvantage.

"We are after a bigger share of the market," he said. "Even a 1% increase would be significant to us."

STC is the UK's largest distributor and holds 15% of the market. It sells 40,000 products from transistors and passive components to £20,000 computers.

The company was first dedicated to synchronous terminals rather than the asynchronous type dedicated to the one service because of the cost that

would have been involved, either for STC or for its customers, of installing them everywhere they might be wanted.

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Ex-Cii HB boss slates French 'butchery'

by Jack Gee

THE French Socialist government's computer industry policy has been condemned by Jean-Pierre Brulé, former chairman of Cii Honeywell Bull, who was ousted from his job in 1980 by former President Valéry Giscard d'Estaing.

Brulé left the French computer firm after challenging the Conservative Government's decision to transfer Compagnie Generale up a 35% share of Olivetti.

Interviewed by the French computer publication *Ordinateurs*, Brulé vigorously attacked the nationalisation of the major firms involved in information technology.

He said: "I am unfortunately compelled to express regret that, instead of improving France's position in the mass market for computer technology, software and distribution, the government's action in 1982 was aimed solely at concentrating the means of research and production."

Brulé said the decision to restructure microcomputer manufacturing around Cii-Honeywell Bull's offshoot R2E at the expense of Thomson and CGE had meant

"butchering the industry by politicians against the advice of industry."

Complimenting his successor, Jacques Stern, on the industrial strategy he has announced for Cii Honeywell Bull, Brulé added: "The French information technology industry can no longer permit itself to make any mistakes."

Recalling Saint Gobain's entry into Olivetti, Brulé said: "This was a financial fiasco. Our principal shareholder's money was used by an opponent to strengthen his position to our disadvantage."

"I have to take off my hat to Signor De Benedetti (managing director of Olivetti). This experienced businessman brilliantly got everything he wanted — and for nothing."

Brulé argued that distributed systems offered the only hope for the future of France's computer industry.

New de facto standards are coming into existence on a world scale with compatible hardware, software and peripherals. The real battle between manufacturers is being fought at the level of standardisation.



BRULÉ... "Working on interfacing more."

HP pushes factory automation links

by John Riley
HEWLETT-PACKARD last week pushed out its links to the top European factory automation computer makers.

The company launched a new software product to interface industrial automation programmable controllers to its HP 1000 A-Series of minicomputers. And it reaffirmed its commitment to OEMs by launching a compact integrated version of the HP 1000 A-Series.

The software product, called PCIF/1000 (Programmable Controller Interface) can link Allen-Bradley, Siemens and Telemecanique controllers, and, according to HP, reduces the tedium of communication protocol programming.

"Those are the three main European market leaders for programmable controllers," said Jean-Pierre Baudouin, product

marketing manager of HP Grenoble, "and we are working on interfacing more." The price ranges from £4,054 to £7,002.

The compact, repackaged HP 1000 A-Series, called the Micro/1000 family, brings the minicomputer performance down to microcomputer size.

The price ranges from £10,122 for the 1 mips Micro 26 system to £21,758 for the 3 mips Micro 29, including integrated peripherals. It is aimed primarily at OEMs in the industrial automation market — "but also at anything that needs a real time aspect," said Baudouin.

Two other software facilities were announced — an applications package, called HP QDM/1000 for statistical quality control, and a revised version of the RTE-A.I. operating system, which will be supplied free to those with the older version.

US giant puts \$500,000 centre in Cheltenham

by Nuala Moran

US ELECTRONICS conglomerate Bunker Ramo has invested between \$500,000 and \$600,000 in the establishment of a technology research and development centre in Cheltenham. The new company is called Bunker Ramo UK.

It has taken on the development staff of Linotype Paul, the phototypesetting company which was recently shut down by its German owners.

Twelve ex-Linotype staff are now employed by Bunker, including programmers, supervisors and engineers. It is intended to increase staff to 20 as soon as possible. In 1984 this number is expected to go up to about 30.

The role of the UK division will be to provide systems engineering as part of the new product development organisation. At the moment it is supporting activities in the US by producing local and wide area network communications interfaces for Aladdin, a range of new products which will include office automation packages with industry specific applications.

David Hearn, UK product development manager, said: "At the moment we are purely supporting what's happening in the States, and they wouldn't be able to meet demand without our assistance."

The UK division will eventually be responsible for system and product development directed to the international market.

The US-based company produces computer systems for the financial market.

Hearn explained that one function of the technology centre in the UK would be to make the modifications necessary for the banking and finance systems to be applied in the UK and Europe.

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Perkin-Elmer says it has cheapest 32-bit

by Nuala Moran

PERKIN-ELMER has set its sights on the small business user with the launch of what it claims is the cheapest entry level 32-bit mini.

The 3205 is also claimed to be the first 32-bit machine to be based on a single board. The printed circuit board measures 15x17 inches. For a bare machine the price is £3,450, but OEMs can get them for £3,250 at the maximum discount rate. A basic system with 32 Kbytes of memory, 50 Mbytes of disc storage and eight ports costs £18,710.

The 3205 is aimed to compete with the top of the range 16-bit machines and has a Whetstone rating of 6 mips.

Traditionally Perkin-Elmer has catered for the scientific and technical market, but Brian Hanley, UK marketing director, explained that P-E was trying to break this

mould and go for volume sales in the commercial market.

The 3205 will be offered to OEMs under P-E's partnership plan, a scheme started in March to gain volume sales in the commercial market. This deal includes discounts on hardware prices, free support and training, half costs on approved advertising and providing sales leads.

At present 30% of P-E's commercial sales are through OEMs and 70% direct, and Hanley wants to reverse this. He has rejected the idea of increasing business by getting into supplying applications software as other manufacturers have done, because this is out of P-E's area of expertise.

Negotiations are going on with 90 OEMs and so far six have been signed. Hanley feels that the decision to go for the OEM market was timely as P-E's competitors have turned attention to end users.

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BSL Systems Ltd. BSL SYSTEMS

Abingworth sets banks an example

WHEN banks talk, as they frequently do, of the risks of high technology investment they could do worse than look at the track record of Abingworth plc.

Abingworth is a venture capital investment company, resident in a relatively small and unpretentious suite of offices opposite the Economist building in London's St James's.

The company, founded in 1973, has recently gone public by selling four million of its 10p shares to the investing public and financial institutions for £3 each. In order to go public Abingworth released a prospectus which lists many of its major investments, and which also gives a record of the realisations it has made on shares in which it has invested in the past.

Out of 28 sales so far Abingworth made a gain, in some cases a very substantial gain, on its investment and what is more important it has made losses in only two instances.

This is a better rate than was predicted for venture investment by Frank Kenny, the managing director of investment company Initech which recently went public. Kenny broadly suggested that for a good venture firm a nil return on around 20% of the investments

would be normal.

This is in sharp contrast to big bank estimates that in the UK about three out of four companies will fail in the early years.

Taking a selection of Abingworth's computer industry investments and subsequent sales the company made \$3.8 million on shares in Apple Computer, shares which cost \$39,375. This is a gain of about 100 times on the original cost.

The sale of part of Abingworth's stake in Mousale Data Sciences realised a profit of \$994,926 on an investment which cost \$147,180. This is a more normal realisation of profits in the mid-range of a venture capital company's portfolio, and is repeated in the \$2.08 million profit on the sale of a stake in Standard Micro systems which cost \$373,004.

Other significant computer industry investments and their disposal were Digital Communications Associates which showed a \$261,624 profit on shares which cost \$63,576, and Penta systems which showed a profit of \$254,000 on an original cost of \$110,000.

According to Peter Dicks, one of the founders of the company and a current director, Abingworth has increased the value of its

assets per share by an order of just over 10, in a 10 year period, from 28.09p a share in 1974, to 307.44p a share now. The entire proceeds from the current sale will go to enable the company to make further investments, Dicks said.

At the moment Abingworth has a total of about 60 investments, 85% in the US and the remaining 15% in the UK and Hong Kong. The company has been actively looking for high tech companies in the UK in the past year or two and Dicks points out that Abingworth has made investments in Tim Keen's Keen Computers to Nottingham, and in Bradford-based Microvitec.

Unlike the traditional UK investment company or trust however, Dicks says that Abingworth did get involved where appropriate, with its target companies. The involvement can be as limited as the provision of business contacts, or as extensive as board membership and direct advice.

This is typical of the way the really good venture capital companies in the US work, and it is obvious that Abingworth has adopted more of the US style than just shares in the old US corporation. How does Abingworth find the companies to which

it invests? This question causes Dicks to pause a little, but the reply is partly what you'd expect.

Some introductions come from business acquaintances he says, some from professional advisers, some from papers like *Computer Weekly*, some from other venture capitalists.

In the Prospectus Abingworth lists some of its larger investments which are still retained on the books. The list of 15 companies is led by four companies.

First of all, Apple, in which Abingworth holds 500,000 shares,



DICKS... Will make further investments.

which the company bought for \$140,625 and which is currently valued at \$25,968,750. The amazing Apple is however, closely followed by Standard Microsystems Corporation, where Abingworth holds 5.6% of the equity at a cost of \$200,000 and currently valued at \$10.2 million.

Third of the major successes is Digital Communications Corp, where for an investment of \$559,799 Abingworth has now got a stake worth \$4.4 million. Finally, the residual stake in MDS held by Abingworth is worth \$2.6 million, against a cost of \$377,820.

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Why big profits can be bad news

by Philip Hunter
LARGE pre-tax profits represent wasted opportunity for a company intent on fast growth. They give the taxman funds that could have been spent on research and development.

This philosophy has been successfully applied for some years by London-based Package Programs, which supplies the financial community with software for minis and mainframes.

The company has reported a profit of just £5,000 for the six months ended March 1993, which is only a loose change compared with the turnover of £1.74 million.

Managing director Roy Taylor does not seem too interested in profits at the moment, and points to the fact that the company has expanded its workforce from 30 to 70 in the last year.

"This cost £200,000 before the new staff become effective," Taylor says.

"But the significant thing is the for the third year in a row, revenue has increased by 50%, which is above the industry average."

Projected turnover for the year ending September 1993 is £3.9 million.



TAYLOR... No to big profits.

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SOFTWARE FILE

Merger leads to software consultancy

TWO American subsidiaries of GEISCO, General Electric Information Services Company, are to be merged to form GEPSCO, General Electric Professional Services Company. They are LTI Consulting Services and SDC, and will have a joint staff of £1,500 and \$80 million turnover; they will trade as software consultants based in New York.

It's all Smalltalk

XEROX's Peter Deutsch and Geo Casner presented the firm's Smalltalk-80 high level language and operating system to a meeting of 70 business representatives at a London hotel last week. They were accompanied by Chris Macle, author of the Smalltalk-PC version of the language.

Robotic advice

CAP has been appointed by the Industry Department as a consultant for firms wanting to use robots for flexible manufacturing. It will advise on how to integrate robots, machine tools and computerised production planning systems.

Midas transfers

MIDAS, the banking package designed by BIS Software for IBM's System 34 and 38 machines, is being transferred to the new System 36 machine. The system, which is used on a round 300 sites worldwide, will run on the new midrange colour graphics, electronic mail and personal computing facilities.

Upgraded DASD

COMPUTER Associates, the American software house with \$28 million turnover, has upgraded its direct access storage device manager, CA-MANAGEDASD. Release five will allow automatic migration of data from one direct access storage device to another in program-reachable form. Computer Associates is one of the largest independent firms in the IBM and plug compatible market.

Prime revises

PRIME has revised its mini operating system, Primos, with new features for security, disc space management and support for 2250 peripherals. Tighter system protection for the Prime 50 series will be provided by individual access control lists instead of directory passwording.

Bridge the sales

SPHINX, the new micro software marketing organisation set up in Maidenhead, Berks, has signed up to sell Ethernet-based products for Bridge Communications of California. Bridge founders Bill Carrio and Jody Batrin, ex-Zilog employees like Sphinx's Pamela Geller, are local area network specialists.

Network deal

PLEXUS, the Californian micro maker, has made a deal with Texas network specialist Percom Data to link IBM PCs through an Ethernet local area network. The agreement helps to create an IBM-PC network running applications under the Unix operating system.

Catalyst impact

APPLE-III's could become more easy to sell through a new application manager called Catalyst, developed by Quark of Denver, Colorado. One Apple dealer, DBM of Bristol, reports that Catalyst is already making an impact on sales of the 'previously' slow moving micros.



JACKSON... Took the chance to tear into database approach.

Structured design rivals meet

TWO evangelists of structured systems, Ed Yourdon and Michael Jackson, faced each other at a London conference last week. It was their first meeting on the platform since an encounter in New Jersey six years ago - the atmosphere between them was polite but tense.

At the Pergamon Infotech conference on the future for structured methodologies, Yourdon referred to time wasted on religious battles between their two factions and in silent schism with the rival school or database technology. He proposed a truce so that all parties could acknowledge each other's good ideas.

Jackson, while he did not reject the overture and agreed to appear again with his old opponent, took the chance to tear into the database approach to software, of which both men are long-standing critics.

Yourdon prefaced his address with the remark that the discussion was like a congress of Catho-

lics and Jews to debate the definition of God.

"Technology itself, in any case, was by far the smallest part of the problem facing the business computing world," he said.

"The overwhelming part is political and managerial. It may be well into the next decade before we can say we are all using reasonable methods of systems development."

There was now a widespread awareness of structured techniques in industry, but fewer than half the top companies employed structured analysis.

"It's a sobering thought that top management - the critical people - don't care," said Yourdon. "If we all have to come back here in 1998 to talk about methodology, we shall have blown our entire careers."



YOURDON... Problem is political and managerial.

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Root plugs Unix gap

by Claire Gooding

ONE of the biggest gaps in the fast-growing Unix market has been plugged by Unix specialist Root Computers with a 'friendly front end' interface to the operating system.

ROOTmap is designed to allow non-expert end users to bypass the highly technical gaps of Unix to run their applications.

It provides a series of menus, English commands and help messages, plus function keys to guide the user through to applications instead of ploughing through complex Unix commands.

Vendors and manufacturers who have plumped for Unix as the standard operating system for 16 and 32 bit systems have long recognised the problem that it was built by programmers for programmers.

One of the barriers to its acceptance was the difficulty the user met of finding his way around. Any facility he is likely to need is there somewhere, but it is very rarely called what is expected, and there are no help facilities to cushion expert users.

"Unix is very good for programmers; it doesn't stand in your way if you know what you're doing," explained Mike Banahan,

technical manager for Unix training company Structured Methods. "Unix was organised for use by experts, so the naive business user needs a different level of communication."

"One of the advantages of Unix is that it does allow you to change the interface."

There have been other attempts to give Unix a user-friendly interface, including the impressive menu shell which Fortune surrounded its Unix implementation. Root, however, stands some chance of fulfilling its claims to have launched the 'standard' user interface for Unix, since it has a head start over competitors.

Dominic Dunlop, technical director of newly-formed Unix specialist Sphinx, said: "I saw the Root menu shell two months ago, and it struck me that when it was fully documented and packaged it would be one of the very best products of its sort available. Sphinx, which was formed to market Unix-based products, is currently negotiating with Root."

Managing director of Root David Sanderson is confident that ROOTmap will quickly be recognised by users as what they've been waiting for, and con-

sequently become a standard interface.

"The significant advantage of ROOTmap is that it will go on the front of anything - payroll, ledgers, and the electronic mail software," he said.

The program, called Expert-ease, a spreadsheet rule-generator for the IBM-PC and Apple-II, was devised by Michie's firm Intelligent Terminals. Written in UCSD-Pascal, it is to be distributed mainly to large corporations by Expert Software International (ESI).

Set up by ex-ICL manager Sandy Blackie, ESI achieved celebrity as the backer of Toolbox, a utility collection for the Sirius.

Toolbox is now being promoted in the US by Professional Data Systems of San Diego, California. Professional Data Systems is run

by ex-Victor dealer and mail order king Richard Rubin, who now has representatives in 65 of the major American cities and will be selling Toolbox both for the Victor and the IBM machines.

Meanwhile, ESI is on the lookout for other homegrown products that can be repackaged and sold profitably to the American market. The Expert-ease system is aimed at allowing managers in big companies to develop complex programs to handle financial, training and management problems.

ESI is also taking on Keystar, a keyboard developed by Edinburgh University's Wolfson Microelectronics Institute. The idea is to convert micros running the Wordstar software into dedicated word processors with a 56-function keyboard.

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Meanwhile, ESI is on the lookout for other homegrown products that can be repackaged and sold profitably to the American market. The Expert-ease system is aimed at allowing managers in big companies to develop complex programs to handle financial, training and management problems.

ESI is also taking on Keystar, a keyboard developed by Edinburgh University's Wolfson Microelectronics Institute. The idea is to convert micros running the Wordstar software into dedicated word processors with a 56-function keyboard.

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Ericsson offers four million shares in New York

SWEDISH telecommunications supplier L. M. Ericsson has followed fellow Scandinavian company Norsk Data on to the New York Stock Exchange, but for a somewhat larger funding.

Ericsson, which is the world's largest supplier of digital telecom-

munications outside the US, is offering four million shares at a price of \$62.5.

If US financiers take up the offer, and the indications are that it will be many times oversubscribed, the Swedish giant will have raised \$250 million, the largest

foreign flotation ever on the NY exchange.

L. M. Ericsson is already 20% owned by investment interests in the US and it is likely that the money raised will be used partly to make acquisitions in the US.

Ericsson took over the old Data-

saab DP interests in 1981 and the process of integrating the company is still going on. Swedish sources say that Ericsson will relaunch the Datasab company later this year, in Scandinavia, and in the UK, with new products and an enhanced image.

Success follows ACT

ACT is undoubtedly one of the industry's successes on the Stock Exchange, and that success is predicted to continue in the results due this month.

Industry analyst Neil Barton at Stockbrokers Cooke Lumden is confirming the company's own forecast of £2 million profit for 1992/93 and is forecasting a major advance for the next two years.

According to Barton, and provided only by the way the company's new Apricot performs in the market place, ACT should show profits of around £5 million this time next year, and £12.5 million in 1994/95.

Apricot is ACT's own desktop computer which the company is building to market in support of the hugely successful Sirius machine.

According to Barton, the Sirius 16-bit microcomputer, which was designed and built by Chuck Peddie, formerly of Commodore, has contributed £1 million to ACT's profit this year.

Next year, Barton forecasts a contribution of £2 million from the Sirius and related activities, based on sales of 18,000 to 20,000 machines.

ACT, which is currently headed by Lindsey Bury, a former banker who rescued the company some years ago, won much of its market lead due to the late appearance of the IBM PC, and indeed also due to the late appearance in the UK of the Digital personal computers.

This delay allowed ACT, based on aggressive marketing, to establish an almost unassailable user base for the Sirius according to



BURY... ACT's head.

Barton, who reveals that in February this year ACT sold 1,125 Sirius machines, against 490 IBM PCs.

During 1992 the company actually sold 7,000 Sirius micros, and is currently spending

Speed-up for 68000 machines

by John Riley
LONDON-BASED Bleasdale Computer Systems and Massachusetts-based Pixel announced upgrades for their Motorola 68000-based Unix microcomputers last week.

Increased speed is the keynote of Bleasdale's HDC 6800A machine, and is achieved with a new 48 Mbyte 5 1/4 in Winchester disc drive from Atari which has a disc seek time of 30 milliseconds.

"Today's user is intolerant of any slowness in a system," said managing director Eddie Bleasdale, "but there's no way he can complain with these speeds."

Bleasdale chose Atari in a novel way. "We placed placed orders with all the companies which

claimed this performance, and saw who was in a position to deliver. Of these we chose the fastest." Other enhancements include easier system cooling, and optimised software to select data off the disc more quickly. The price for the basic system with I/O ports but no terminals humbled, but including Unix, is £8,000.

Bleasdale expects sales of £150,000 to end users over the next few weeks, and that does not include OEM sales.

The American machine, the Pixel 100, which saw its first US shipments last July, has been upgraded with a faster version of the 68000 and faster memory chips.

These give a 30% increase in performance - at no extra cost,



BLEASDALE... "Today's user is intolerant of any slowness".

according to Pixel's UK marketing manager Jan Klin.

And an even better price/performance machine is on its way. US customers will soon take delivery of the Pixel 80, which uses the 68000 family.

"It should reach the UK in the autumn. Pixel was originally a division of

Instrumentation Laboratory, alongside IL's analytical and biomedical instrument activities.

Founder Tom Rosse sold out to Allied Corporation, then rebought Pixel as a separate spin-off. Most of the senior management are still with Pixel, although general manager William Southworth left in April after he lost to Rosse in the buy-out bidding.

Immediate attacks rugged portables

DATA capture and billing machine specialist Immediate Business Systems is out to break into the rugged portable micro market. Nomad, a machine styled as "the microcomputer that goes where the job is," takes elements of IBS' Portable Billing Machine.

IBS, based in Milton Keynes, hopes the British-built Nomad will make a dent in a worldwide market it sees as unexploited - mainly through a lack of awareness out there of the existence of micros that can cope with wide temperature ranges, dust and water without giving up. There are already such machines, notably rival British contender Husky from Coventry-based DVW Microelectronics, but market awareness of their capabilities seems low.

The 2801 processor - L for low power - runs under an IBS-written executive that supports normal Microsoft Basic. Programs written in the Microsoft Basic under CP/M on desk-top machines back at base can be down-loaded into Nomad. The executive and Basic reside in 16K of EPROM. There is 32K of RAM plus 64K,

128K or 256K of bubble memory arranged as if it were disc. Price range from £2,236 to £3,136 for 64K and 256K of bubbles.

IBS offers no application packages, and will rely on the system houses through which it will sell the Nomad to provide packages users do not want to write themselves.

At first IBS will concentrate on the UK market, where it is looking to sell hundreds of machines in 1983, followed by the US and France, where it has sister companies. Next year it is planning building and selling in thousands and enhancing the machine with more memory and interfaces.

IBS has just signed up as its main UK distributor for the Hysit bubble cassette. A large market IBS will be going for is the British military, says sales and marketing manager Chris Pickles. Rival DVW already has several large contracts for its Husky connected with the King missiles and various tanks, he says. Pickles sees no reason why military should not buy Nomad too.

UK leads US in use of small computers

by John Riley

THE UK is a year ahead of the US with the general acceptance of small computers. That is the view of Liverpool's Herbert Martin who, after 16 years in the US, has returned as vice-president of European operations for US microcomputer manufacturer Onyx/IMI.

"The US is a large place with a large market, but on a per capita basis the number of small computers sold doesn't look so large. I have been amazed at the utilisation of personal computing in the UK and at the knowledge of people in unrelated industries who are using small computers in personal type applications," he said.

"The reason the UK is ahead of the US is that online service bureaux advanced more rapidly in the US because of the Bell system communications network, whereas in the UK people have been more independent. That has created the skills for small computers in the UK."

Martin was formerly president of Mercator Business Systems, which produced 16-bit micros running the Oasis operating system. Mercator was acquired by Onyx.



MARTIN... "Amazing".

last December and its sales added to the Onyx family of micros, which were among the first to support Unix.

Onyx will expand later this year into the lower end of the high-performance micro market with two products. One is a single board 68000-based machine running Unix System III. The other product will be based on the upcoming Intel 186 and will handle MS/DOS and CP/M-86 operating systems.

Martin's new job as vice-president of European operations will be to promote the image of the company and build up its support base. Onyx sells only to three systems house distributors, Sun Data, Thame Systems and Kam Computers, and has no plans to sell directly to end users, or to expand the number of distributors.

Cut out key strokes

by Philip Hunter

ACCOUNTANTS and solicitors could soon eliminate the tedious keying-in of information needed for billing clients. A small portable computer from London-based Technology for Business, called TimeLog, works like a stopwatch, and enables a solicitor, or any professional fee-earner, to record automatically time spent on a billable activity.

would be done by passing the light pen over a bar code printout of the client's name and the activity.

The machine, which costs £300, allows 30 different activities, and up to ten different categories of client.

Typically a solicitor has one rate for client being given free legal aid, one for rich clients, and one for poorer clients.

The company has also in-

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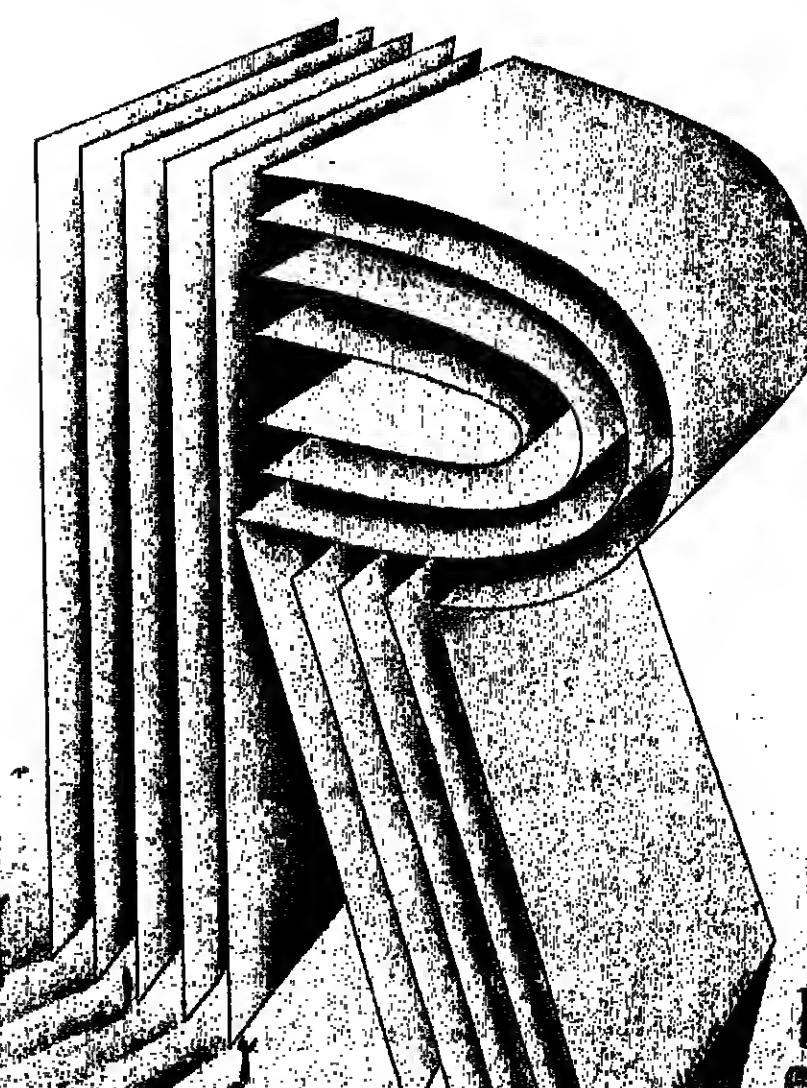
Where others have tried to propose relational or pseudo-relational components that exist separately from the production database, Cullinet's is the only one that lets both work together. Thus serving the whole corporation by serving all of the needs within it.

IDMS/R.

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Cullinet



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Why British industry is ripe for major growth in buy-outs

MANAGEMENT buy-outs, ranging from small £100,000 purchases to transactions of £20m and more, have emerged in the past two years as a strong revitalising force in British industry.

Perhaps the single most striking new dimension has been the inclusion in Britain of a growing number of multi-million pound buy-outs. While these had become commonplace in the US in the 1970s, in Britain almost all had been at the smaller end involving a few hundred thousand pounds.

In December 1980 Trufo, the Birmingham engineering subsidiary of Wilsons Reedman, was bought for £7m by a group of investors comprising Trufo's management and some of the City of London's leading investment institutions. And at the end of April, 1981, the senior managers of Keep Brothers - the Birmingham-based foreign trading house with a turnover of more than £30m - bought the company for over £3m; until the buy-out, about 50% of the shares were in family hands.

Other important management buy-outs have included Ansofive, formerly a subsidiary of ACC, Sir James Goldsmith's Cavenham Group which sold its Cavenham Confectionery subsidiary to four of Cavenham Confectionery's directors, who have renamed the company Famous Names; stockbroker Vickers de Costa whose directors and senior management led a buy-out scheme; the £53.5m government-approved sale in October 1981 of the State-owned National Freight Company to its management and staff; plus more recently the £16m buy-out of the Electrical Division of Stone-Platt Industries in May of last year and the purchase of Radway from Forward Technology Industries just before Christmas, 1982.

When are management buy-outs the answer? Let's first look at situations where the senior executives

of a large diverse group have agreed privately that it would be sensible to sell a division or subsidiary which has earned a steady profit but has become peripheral to the group's main business activities at a time when the board is looking for ways to reduce the group's borrowings - a situation facing many British companies these days.

Usually, the first idea is to seek a corporate buyer. But sometimes there are no such buyers - or none willing, or perhaps able to pay cash. There could be a monetary difficulty, or the sale to a competitor could bring problems if the division being sold is an impor-

It is not very surprising, given the recent adverse economic climate in Britain, that management buy-outs on this side of the Atlantic are growing apace both in number and size of investment

tant supplier to, or customer of, other group companies.

On the other hand, a sale to a group including the management can often meet the case very neatly. A good cash price can be obtained, and the upsides and possible defections which can often result when the divisional managers learn they could be sold to another company are avoided.

Much the same applies where the seller is a private shareholder company. The problems of selling can be much reduced if the management is co-operating fully in the sale. And in such situations the seller, who may himself have created the business and hired and

trained the managers, is pleased to see the company carry on as an independent business, thereby giving his proteges a chance to accumulate capital.

At the same time, the seller receives a fair price and can arrange his affairs to the benefit of his heirs at a time when the political climate is relatively favourable to such deals.

Since most management teams of five or six individuals in Britain cannot muster more than £100,000 to £200,000 between them, the objective must be to ensure a significant personal commitment by the managers while not encouraging them to overstretch themselves. This in turn means that the purchasing company is normally financed with a substantial amount of gearing in the form of bank debt or subordinated debt from the investing group which also provides most of the equity finance.

A typical example of the financial structure of a management buy-out is given as follows for the XYZ company:

Purchase price	£ 2,850,000
Extra for fees, expenses, etc.	150,000
	3,000,000
Bank loan (5 years)	1,500,000
Redeemable preference shares (6-10 years)	900,000
400,000 'A' ordinary shares (£1.25)	500,000
100,000 'B' ordinary shares (management)	£1,100,000
Five managers obtain a total of 20% of ordinary equity with an incentive scheme whereby if they meet their targets for pre-tax profits over five years their equity stake rises to 30%.	
Other features are that managers can offset the interest on the money borrowed to buy the shares against income for tax purposes;	



Buy-outs have been a strong force in British industry.

and managers can roll-over capital gains.

The main point to note is that some of the loans - not the top ranking bank loans - carry with them the right to subscribe for a proportion of the common equity as, of course, does the preferred stock, with the rest of the equity allotted to the management and the organisers of the operation. Sometimes the seller is prepared to take part of the consideration in deferred form, for example through a loan stock, and this may be crucial since it both gives confidence to investors and reduces the amount of new investment money needed.

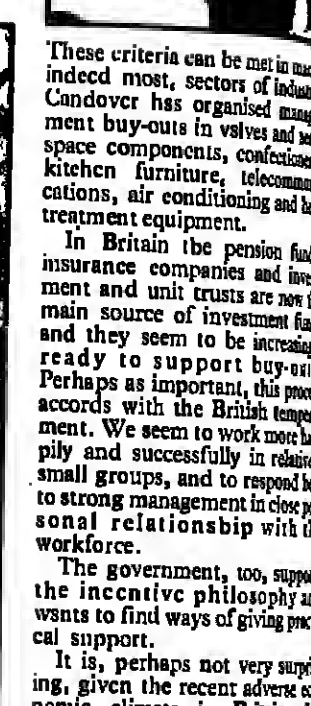
There are, of course, a host of variations and some of the financial structures devised are ingenious and complex. They usually involve a substantial amount of in-



terial gearing, since only thereby can the common equity be reduced sufficiently to allow the management a significant "incentive" share at a price they can afford.

Businesses suitable for management buy-outs must have a history and prospects of profits and cash-flow which would persuade investors that in future they will be able to service and repay the loans and redeem the preferred stock. Solid assets help to reassure investors, as do a good spread of products, a well established market share and relative invulnerability to sudden technological change.

The business must itself be relatively debt free and, above all, have proven management. In general, well established cash-generating companies with experienced management are the best candidates for buy-outs.



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Roger Brooke is chief executive of Candover Investments, a leading UK management buy-out specialist.

ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, June 16, 1983

Act now on software piracy

THERE is at last a realistic hope that an international agreement can be reached on the copyright of software. A meeting taking place in Geneva this week, under the auspices of the World Intellectual Property Organisation, will spend five days trying to agree on a software treaty.

Software piracy has been a headline grabber for some years, particularly with the onslaught of the microcomputer. But the computer industry has been slow to push its case forcefully either nationally or internationally.

It was as long ago as 1977 that the Whitford Committee made its recommendations on copyright. The departmental committee said that although the law of copyright probably provided protection for software, it would be better to remove any uncertainty by enacting legislation.

Another four years passed before the last Thatcher government published its July 1981 Green Paper which accepted most of Whitford's recommendations. The Green Paper called for explicit legislation that would give computer programs and data the same protection under copyright law as literary works.

When the Green Paper was released, Reginald Byre, Parliamentary Under-Secretary of State at the Department of Trade, called for a "wide public debate which will enable the government to finalise its views".

A measure of how seriously the computer industry took the problem was given a year later when Barney Gibbins, Barney Gibbins and others. It is also undermining the meeting in Copenhagen that only three of the 190 members of the Computing Services Association responded to the software copyright Green Paper.

Some of the inertia of which the industry has been guilty of might be explained by the complexity of trying to formulate legislation on software copyright. Perhaps the computer industry itself could understand the intricacies of "inventing" a program may have seemed too daunting a task.

Much of the work on copyright in this country has tried to encompass software within the definition of a literary work. That path always seemed to be a compromise, and attempts to extend the Forgery and Counterfeiting Act of 1981 to software never seemed an adequate response.

The Exxon case heard by the Court of Appeal in June 1981 showed the difficulty of the "literary" approach. Exxon had appealed against the dismissal by the High Court of its claim that the word "Exxon", as an original literary work, was entitled to a copyright. The Court of Appeal ruled against the appeal, stating that the word could be termed original, and also a work, but it was not literary.

What the World Intellectual Property Organisation (WIPO) has done is to draft a law exclusively for the software industry. The organisation, which is an international union for the protection of industrial property, goes well beyond existing copyright legislation. It has also put copyright where it belongs - in the international arena.

A good deal of credit must go to the Computing Services Association, which has been steadfast in its recognition that software copyright is essential to the health of the UK software industry. The CSA has made its views strongly known through the Department of Trade, the UK body which has been co-ordinating the national response to the work carried on by WIPO.

Doug Byelons, chairman of the CSA, has pushed hard to ensure that the European Computing Services Association would be represented at Geneva this week. He has stressed that it is a "very important conference", and it would do well for the industry as a whole to take note.

Bearing in mind the length of time it has taken for the European Convention on Data Protection to take hold, it is clear that any draft treaty agreed on in Geneva will certainly have no easy passage in gaining acceptance by individual governments. All those who have doubted and procrastinated must now make their voices heard.

It would be a sorry indictment indeed if any agreed treaty on software copyright received the same half-hearted reception as was the case with data protection.

Unauthorized copying of software is theft.

1984 and all that...

THIS week's example of the strange things people say about computers was sent in by Ed Doodman of Leeds, who wins £5. Since which has pioneered the way in cheap easily accessible home computers, has developed its own language called Basic.

LETTERS

Cautious steps by legal profession

THE National Law Society (Computer Weekly, May 12) is investigating ways in which information can be used to advantage within the legal sector and Nuala Moran has reported that Professor Campbell emphasises that the society aims is not to "apply technology regardless".

It is this kind of cautious and considered approach by the legal profession which draws attention to the importance of involving the potential user at all stages of the technical development programme.

The government has given

support to the universities and polytechnics in providing a high standard of training in the processing of information: it is, however, important to appreciate that if the recommendations made by the Alvey Committee are to be implemented in the wider acceptance of the new facility, the users' requirements are paramount.

There is a growing concern for the quality of information, and it will be the special responsibility of those with considerable experience in the different professions to compare available systems and to

evaluate the content of databases if these are not to be seen simply as sophisticated and costly card indexes.

It would appear, then, that encouragement might be given now to those at the peak of their professional career towards a greater degree of involvement in the application of the new technology where their contribution would be invaluable not only to their own particular field but also in the promotion of British industry.

DOROTHY ROSS
Technical Information Officer
Manchester.

Practical view of SSP

IT is certainly getting rough, with accusations flying around about what is and is not right with one or other of the many SSP systems on the market.

It seems to me that all the systems' suppliers got something or other wrong with their understanding of SSP. Mealy, I feel, they did not understand the routine operation of payroll to which SSP has to be closely linked.

The purists who stuck to the letter of the SSP law should get some understanding of how PAYE and NI are actually handled in practice as against the strict rules, and they would have a shock.

The one group who got it exactly right were all those lovely users out there who were not bamboozled at all. Readers will have seen the forms of my SSP system (Computer Weekly, January 6). Well, I sold over 3,000 kits of these forms right up to the SSP starting date, and hardly any since.

More surprising is that the number of phone calls I have had raising queries on the operation of SSP can be measured on one hand. My local DHSS office also reports no great rush of queries. So much for all the confusion and difficulties - it's just not occurring like the axe grinders said it would.

I do have to add fuel to the disagreements by taking issue with Mike Coppleston (Computer Weekly, June 2) on the question of the daily offsetting of other payments against SSP. He is quite right that this is a fundamental requirement of the legislation. But the requirement is for the offsetting of all payments in respect of the day for which SSP is paid, not just occupational sick pay. The total of all payments made in respect of a day can only be known in the payroll system so I submit offsetting is a payroll and not an SSP function.

What makes this legalistic view laughable is that failure to offset breaks no laws. The employer is entitled to recover the SSP from the government whether he offsets or not as he has a free choice if he wants to overpay his employees. Some employers may well decide that the incidence of loss in their circumstances is so low as not to be worth trying to prevent.

I think I have made my point that there is a practical as well as a legalistic view of SSP.

Turning to a practical legal point: Employers with a "direct interest" in a trade dispute can be excluded from SSP entitlement. The legal question arises as to how direct is direct. In conversational terms insurance officers' decisions have always interpreted the expression to mean "virtually automatically". Now the Court of Appeal has had occasion to consider the matter and decided that the words mean "very direct".

So unless the individual will receive some benefit automatically from the outcome of a trade dispute he does not have a direct interest in the matter. That might have always been the law (the same words are used elsewhere than in SSP) and obvious, but it's not the law, has been interpreted by insurance officers in practice.

CLIFF DILLOWAY
Stroud.

Quicker answers

I WAS not surprised to see yet another attack on British Telecom (Computer Weekly, May 19) but, I am left wondering what are the writer Andrew Thomas' mathematical qualifications, or has his article been influenced by Mercury? Thomas states that "the longest delay encountered by subscribers is not the time taken for an operator to look up a number, but the time taken for them to say by the phone". Can't he see that by reducing the average call by 12 seconds means the next call is answered 12 seconds sooner. This is equivalent to a 30% reduction in waiting for a call to be answered, while the staff reduction is only 25%.

The reduction would occur over a number of years. Quite obviously the service quality will be improved not only by the reduction of the "waiting time" but also by the computerising of the service.

R. J. HEWITT
Director, Hi-Tech Computer Systems, Nottingham.

Two-way deal

I WOULD like to correct what I hope was a mis-print in your article on the recently announced IBM CMA scheme (Computer Weekly, June 2).

CMG is keen to pursue negotiations with IBM and would like to think that any agreement will be somewhat less ephemeral than is indicated by the two days mentioned in the article; in fact a two-way deal is what we are after.

R. J. WHITE
Managing director
Information Management Services, Exeter.
CMG
Croydon.

DOWNTIME

The acceptable faces of new technology

IT was one of those nights at the OK TV studios programmes. Black Geoff Howe, of the notorious Ma Thatcher gang, Doc Owen from the gang of four (since, of course, reduced to two, with the Doc about to be upgraded above his gang-mate), and Desdave Deaneley, once the terror of the Lazy R ranch down in Deadman's Gulch, Westminster, were ready to shoot it out before the TV audience.

Desdave fired first. With barely a flicker of expression, he raised an eyebrow and took careful aim at Black Geoff.

Showing no mercy, he outlined his gang's plans for creating new jobs on the range.

Almost immediately, Doc Owen opened up too, catching Black Geoff in the crosshairs.

"Our plan for jobs is the only answer," he growled.

Things were looking bad for Black Geoff. But just in the nick of

time, the cavalry arrived in the form of TV technicians obviously bribed by Ma Thatcher.

Ducking behind a microphone, Geoff shot back: "But look how we've created new jobs, and we've helped new technology industry!"

And there, on the back projection screen was a familiar face. Was it John Wayne? No.

It was none other than that ex-Sydney boss Big John Gow, living proof of the success of Ma Thatcher's regime of terror, recipient of a meagre £8 million rescue bid from CDC.

As the smoke cleared, the anxious viewers looked for the tell-tale bullet holes which would indicate which of the gunfighters had lost.

Doc and Desdave sat impassively. Black Geoff too had survived, but not without injury.

His face was covered with egg - not a pretty sight. His one fall-back would be that it was ITV director

of the programme, First Tuesday, who singled out Gow as an example of the better things to come.



Maggie's lack of vision

THAT advocate of high technology, the charming M. Thatcher, displayed a rather tenuous grasp of one aspect of it on TV the other day.

On the BBC's Election Call phone-in programme, The Leader

Sweet nothing
STUDY if you will this photo on the right. The charming young lady is being offered a rose by the dinky little robot. How sweet. Just an ordinary picture from Zenith Data Systems. The accompanying text is even worse. For one thing, it's in German. But the Computer Weekly German expert tells me that the rough translation runs something like: "Here we see der wunderbarer robot, Hero I, showing his gut taste."

BT's late spectacular?
"THE world of office technology and micro automation is littered with spectacular claims and even

more spectacular crashes." - BT Merlin recruitment ad.

"We have the technology, the product range, the service support, and, of course, the list... with more than half a million business subscribers we have a head start when it comes to hot leads." - Same BT Merlin ad.

"First class training... rewards... High rise prospects... sharpening old skills to a new razor edge of professionalism." - Still the same BT Merlin ad.

Well, BT's made a good start with the spectacular claims. Will there be an even more spectacular

collapse?

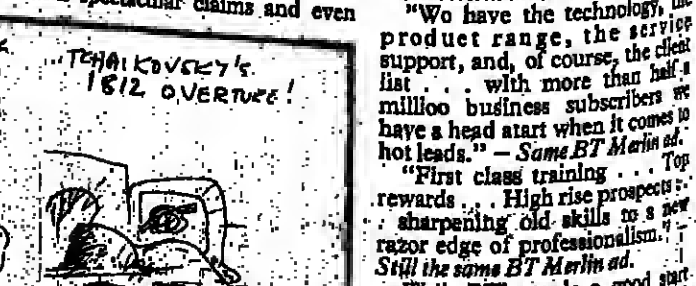
Yorkshire Evening Post.

10 YEARS AGO

FROM COMPUTER WEEKLY OF JUNE 14, 1973: A new range of computers, the Agon 700 series, was announced by Ferranti. UK computer services business achieved a 15% increase in 1972, reaching £79.7 million. A clear indication of the kind of fourth generation mainframes expected from the major manufacturers came with details of IBM's Future Systems machines.

Liveware File

by Don



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HOLIDAY CAMPS

Computers at the poolside are a frequent sight in Club Med villages, as Jack Gee reports

Let the tourists learn while taking a break

WHEN Gilbert Trigano, head of the Club Méditerranée holiday empire, took over the Sicilian village of Kamarina from an unsuccessful competitor three years ago, he discovered a minicomputer in the accounts office. The machine had been used by the previous operator to log financial failure. For Trigano, it provided an ingenious and profitable brainwave.

Trigano's aides tried to discourage him when he announced a plan to install a workshop at Kamarina where holidaymakers — or Gentils Membres (GMs), as Club Med calls them — could learn the applications of computer technology. "Computers in a vacation village? They'll feel they are back in the office," the critics protested. But Trigano, who will shortly give up his chairmanship of Club Med in order to mastermind the 1989 Paris Exhibition, got his way. Convinced that the GMs' curiosity would be whetted, he sounded out

computer and terminal manufacturers and French Telecom.

They agreed to provide the equipment for holidaymakers to communicate with France's Teletel videotex network, acquire a basic knowledge of how to use a

marina 12,000 GMs sampled the workshop's facilities and more than 2,500 of them completed an apprenticeship in Basic, the simplest of computer languages. The Gentils Organisateurs (GOs), or the village staff, were astonished.

The holidaymakers themselves put the computers to work on a variety of tasks, such as calculating and displaying the results of yacht races and tennis tournaments on the terminal screens

computer and, for young and old alike, play video games.

The computer workshop in Sicily opened in the summer of 1981. This year Club Med is offering similar opportunities in 11 villages from New Caledonia in the Pacific to the Bahamas in the Caribbean. The target for 1985 is 45 computer villages.

For the pilot experiment at Ka-

They expected that most of the workshop's visitors would be children looking for a new variety of Space Invaders. But adults made up the majority of computer fans.

Laboriously composing his own program on a computer, a Paris doctor explained: "I would never have had time to do this at home. But when I get back to France I'm getting a computer of my own to help manage my practice."

A lonely wife pleaded with the GO in charge of the workshop: "Please tell my husband you are full up tomorrow. I just cannot prise him away from the computers. We have hardly spent a moment together since we began our holiday."

As the GMs stepped off the charter planes which flew them to Sicily from France, they were handed a brochure with the title "From the circus to the computer". The document explained that, throughout their stay in the village, they would discover a vast range of roles for its computers, including a reservation system for shows under Kamarina's "big top".

The GMs themselves put the computers to work on a variety of tasks, such as calculating and displaying the results of yacht races and tennis tournaments on the terminal screens. Soon the terminals were to be seen everywhere: beside the swimming pool,

terminals. Cable and microwave links were set up between Kamarina and Catania and thence on to Rome, where international lines took over for the connection with Paris.

From the French capital Transpac, France's data packet switching network, provided the link with the host centres that act as telephone exchanges for the data banks. The principal centre was at Vélizy where Teletel is now being tested in 2,300 homes.

The success of the Kamarina test aroused the interest of the foreign firms. Atari, Philips, Sharp and Tektronix now provide equipment for other computer villages. Conscious of the value of Club Med as a shop window for their wares, they queued up with offers to join in the new ventures.

Atari 800s will not be confined to the computer workshop or classrooms, but scattered throughout the village, enabling everyone to familiarise himself with the working of a simple microcomputer system

on the beach, clocking the times of yachtsmen, registering bets on song contests or converting French francs into Italian lire.

In the initial experiment at Kamarina only French firms took part. CII-Honeywell Bull provided eight Micral 8030 and Questar M microcomputers. Four of these were connected to Thomson-CSF videodisc scanners. Matra, Tello, Thomson and Radiotechnique lent seven terminals for access to Teletel.

Establishing a reliable link between a remote part of southern Sicily and the computer host centres in a Paris suburb was a remarkable feat. The quality of the telephone lines from Kamarina was not up to the standard required.

French Telecom asked the Italians for a 9,600 baud line but obtained only 4,800 baud, which meant slower response time on the

Explaining the increasing emphasis given to video games by Club Med, Pierre Schemla, the organisation's computer workshop chief, says: "There is no danger of any of our villages becoming a computerised Las Vegas. Our GOs' job is to help the GMs understand what goes on inside the computers and to invent new uses for them."

The club's most ambitious venture is being conducted at Vitell, a spa in eastern France, by Tektronix and the Centre Pompidou's Workshop for Advanced Technical Research (ARTA). Using a light pen, holidaymakers can draw on the terminal screens. Photographs and other designs can be fed into the computer's memory.

Each village has developed its own uses for microcomputers. Local Club Med traffic managers have discovered they can simplify the transport of holidaymakers by

feeding passenger lists, destinations and charter flight schedules into the machines.

Schemla says: "If Club Med headquarters in Paris had told our people in the field what to do, they would have taken no notice. Now they are devising their own programs."

Club Med says it owes much to Atari, the American firm that specialises in video games. Atari 400 and 800 games computers are being installed at a dozen villages this summer. A Caribbean village is being equipped with 52 Atari 800s.

These will not be confined to the computer workshop or classrooms, but scattered throughout the village, enabling everyone to familiarise himself with the working of

a simple microcomputer system.

Even Club Med's coloured bead necklaces, which replace cash for buying drinks at village bars, are endangered by the advent of the computer. Trigano's experts are now studying their replacement by the "smart card", a strip of plastic resembling a credit card. A microprocessor memory enables it to be used to pay bills, while a secret code, known only to the lawful owner, makes it worthless in the hands of a thief.

This summer, with French holidaymakers' foreign currency allowance drastically limited by the Socialist government's austerity campaign, Finance Minister Jacques Delors could have a new device to ensure that nobody spends more than his due.



Club Med's computers are used at the poolside in Kamarina holiday village in Sicily.



TRIGANO... Convinced that curiosity would be whetted.



Holidaymakers use computer terminals to clock the times of yacht races on the beach.

Which operating system is best? Geoff Stapleton votes for CP/M, and, next page, Carl Phillips elects Microsoft

Don't let IBM dominate all the personal issues

EUROPE surrounding IBM's entry into the microcomputer market may have clouded some important issues. In the fever to "be like IBM" some companies appear to have lost sight of the objectives of having a truly standard 16-bit operating system.

A standard will offer compatibility and portability to software developers, computer manufacturers, end-users and corporate users alike: each of whom will extract individual benefits from it.

The software developer needs a standard to reduce development effort in writing products for a range of microprocessors, thus reducing the cost and widening the potential market. This in turn helps the hardware manufacturer because, particularly in the micro area, a broad availability of applications software sells the hardware.

End-users want a standard to guarantee a good supply and, more important, a choice of packages to keep pricing competitive. They also need a well-established operating system so that their progress is not impeded by bugs, which invariably slip through the net with unproven software products.

Corporate users are looking for even more stringency in a standard, because their use is more complex. Machine to machine compatibility for linking micros within a network, or individually in a mainframe, is essential for a corporate user and opens up the area of protocol emulation for the systems software.

Mainframe installations usually set a high internal standard for application software, and any micro products introduced should be able to match it.

In none of these specific cases is compatibility with the IBM Personal Computer a critical point. Software and hardware devices can be used to emulate almost any type of protocol to link micros, with IBM or other manufacturers' mainframes: this is not the exclusive preserve of the IBM PC.

It is, anyway, a myth that any operating system could offer total compatibility with the IBM PC. To provide 100% compatibility the system would have to run on the IBM PC software and support all hardware options, which would mean faithfully reproducing the functionality of all proprietary circuits and the IBM ROM.

The ROM, however, is copyrighted so that ROM code has to be implemented in a different manner to produce the same result, so that there is always a chance that programs referring directly to the ROM will not run.

There is also the possibility of a legal wrangle with IBM, which has shown itself ready and eager to fight over copyright infringement.

IBM-DOS is, in any case, an IBM-owned operating system and IBM has the exclusive right to change or enhance it as required, without reference to other versions of the basic software.

Many programs bypass the operating system to optimise the disc or screen interface by communicating directly with the hardware, and other systems would be unable to imitate the results. VisiCalc is an example of a program which is like this.



bit standard, it now has over a million users and over 4,000 applications: enough to make the 16-bit marketplace considerably more secure, since compatibility is guaranteed throughout the family.

But how does the CP/M family set about satisfying the needs of users throughout the spectrum, without diluting the strength of the underlying, amply-proven CP/M product?

Digital Research is a firm believer in choice and in giving users the freedom to choose their own direction, rather than pushing them towards a particular environment.

This is illustrated by the fact that the company offers three levels of operating system for 16-bit machines: CP/M-86, Concurrent CP/M-86 and MP/M, and the ability to migrate between them.

CP/M-86 for machines based on the Motorola 68000 chip is also now available, and work on the CP/M-86 network operating system is well advanced.

A further example is the wide range of languages offered under each system and directly available from Digital Research. These include Basic, Pascal, C, C++ and Level II Cobol. PL/I, C and, most recently, Logo. Powerful utilities are also supplied with the operating system to speed systems development and increase users' flexibility.

Eight utilities are supplied with the CP/M-86 single-user, single-tasking operating system, including a text editor which allows string, context, line number and relative position searches, and a fast 8086 assembler using Intel standard mnemonics. Also for system developers, there is a dynamic debugging tool for interactive testing and error correction.

Further, a set of cross-developer tools is provided to assist OEMs in bringing up CP/M-86 on a specific hardware device. These reside on a CP/M-based 8

bit Z80, 8080 or 8085 system and may be used to develop a version of CP/M-86 for the target machine, drastically cutting the OEM's costs.

The operating system itself is designed for ease of transportability, with all hardware-dependent code located in the BIOS, or Basic Input/Output System, which resides at the top of the memory space. A system implementer has only to modify subroutines held in the BIOS to customise CP/M-86 for almost any 8086 or 8088 operating environment, where it occupies only 12 Kbytes of memory.

Despite being so compact, CP/M-86 is very powerful and can

the eight-bit system. This is currently also being implemented into the 16-bit systems.

Plus functionality increases the speed of disc access by about five times, through introducing hashed file directories, least recently used sector buffering, and multi-sector I/O. Automatic disc log in has also been introduced, with CP/M monitoring media changes.

This means that the user need not inform the operating system of a disc change using the RESET command: CP/M will detect a media change and log in the new device, performing no further I/O for files which are already open.

Concurrent CP/M, the single-user, multi-tasking system, al-

ready contains Plus functionality and uses it to great advantage to increase hardware efficiency, and make use of the time that single-user systems inevitably lose to I/O-bound processes.

Like CP/M-86, Concurrent CP/M-86 manages up to one Mbyte of memory, and up to 16 logical disc drives, but each drive may have up to 512 Mbytes of storage.

File integrity is controlled by record and file locking functions within the operating system, inside an overall password-protected security system for user files and directories. Files are also stamped with date and time details, for cross-checking data integrity.

Memory may be partitioned at the time of system generation into segments of between one Kbyte and one Mbyte, and processes are allowed to share re-entrant code. This reduces disc load time and memory requirements when running several copies of the same program from different virtual

consoles.

A physical console can be logically mapped on to any virtual console by use of a single function key, directing keyboard input to the task owning the virtual console and displaying the screen output.

Concurrent CP/M-86 maintains several virtual consoles simultaneously: one of these is always mapped to the physical console while the rest remain in the background. The CP/M-86 Dispatcher requires only from 400-600 microseconds to switch the currently executing task for another, giving greater system throughput.

So CP/M-86 and Concurrent CP/M-86 cover all the needs of the software developer, end-user and system implementer in a single-user environment. What then of multi-user installations?

Digital Research believes in accurately matching operating system capabilities to microcomputer resources for optimising efficient operation. A system such as Unix from Bell Laboratories was initially developed to run on DEC PDP-11 minis as a timesharing program development environment, and as such as a top-heavy piece of software for micros.

Unix does have an excellent range of program development aids, but these are beyond the scope of most end-users and to provide a subset would defeat the objective of the exercise. Instead, Digital Research is helping users to take advantage of the benefits offered by all of the options.

By providing a C compiler and runtime library for each of its 16-bit operating systems, Digital Research has attempted to pave the way for applications developed under Unix to run on the CP/M family.

These programs can be run under the MP/M-86 operating system, which is fully compatible with CP/M, MP/M-II and CP/M-86 to provide a smooth migration and upgrade path.

Geoff Stapleton is a freelance software consultant.

MP/M-86 is a real time, multi-user, multi-tasking operating system suitable for any machine with an 8086 or 8088 processor, and incorporating the advanced features of Digital's other 16-bit systems. It also has a far more effective security system than the raw version of Unix, with an extended file system of record and file locking, dictated by Open File Commands through a Basic-like Operating System (BIDOS) of Passwords, which may be encrypted, provide protection for user files and directories.

Disc management capabilities are the same as those for Concurrent CP/M-86, but MP/M-86 supports up to 254 character 19 devices, such as printers and consoles.

Commands are a superset of CP/M-86 commands, and consist of a library of 24 utilities, many of which will be familiar to users of other CP/M systems, such as PIP, ASM-86, DDT-86 and SUBMIT. By far the greatest strength of MP/M-86, however, lies in its working potential.

CP/M-86, Digital Research's own network, is essentially a Resident System Process (RSP) to the operating system and interface procedures may be included in a MP/M system at generation time, to be handled by the supervisor.

Digital Research has included a series of protocol "handshaking" methods, including one for a simple RS232 interface, to encourage compatibility among hardware vendors. CP/M-86 is ready working on eight-bit systems, but development of CP/M-86 is still in progress.

Until quite recently, operating systems have ignored support of the important and emergent graphics peripheral devices, which threatened to seriously restrict level of device independence offered by a standard operating system to the application developer.

Digital Research has taken the initiative and has designed graphics support consistent with the ANSI and ISO graphics standards.

Graphics products interface at three different levels: GSS-GRAPH, GSS-DRAW and GSS-4010 at application; GSS-PLOT and GSS-KERNEL at programmer; and GSS-86 at operating system level. GSS-86 is essential to drive output devices, but the other products offer alternative facilities to users of differing technical competence.

End-users can quickly generate colour charts or graphs with GSS-Graph or GSS-DRAW, while system builders can create graphics applications using workstation controls and two dimensional primitives from GSS-KERNEL and GSS-PLOT routines.

It is obvious from examining the wealth and type of facilities offered by the CP/M family of operating systems that Digital Research is closely in tune with user needs. The company is continually developing and expanding the capabilities of its CP/M operating systems to match the growing capabilities of microcomputer hardware.

This relationship has not been formed overnight, or on the strength of one successful product: it has grown and evolved alongside the developing micro marketplace.

Surely in the search for a standard 16-bit operating system, stability and mutual trust are factors which far outweigh considerations like trying to follow IBM's

Geoff Stapleton is a freelance software consultant.

Why 16-bits aid puzzled users

ANYBODY developing applications for eight-bit microcomputers has traditionally had little cause to rejoice in the operating systems available. They have often hindered, rather than promoted, software development, and in stark contrast, minicomputer programs have had access to a wealth of software development aids, tools and compilers.

Bringing the two together has been made possible with the new generation of 16-bit hardware. Fast Winchester discs, core memory up to one Mbyte, faster processor speeds and more powerful internal architectures are now common on microcomputers.

Even memory management (both hardware and software) is now beginning to make an appearance. With the advent of the more powerful 16-bit machines came the opportunity to break out at the old mould and offer the software developer a flexible development environment, rich in tools and utilities.

The 16-bit applications developer now has a choice of operating systems with his eyes keenly trained for the emergence of a universal 16-bit standard. However, the developer must beware that the standard under which he develops will also allow his programs to explore the full power of the hardware, and ease the development task.

One of the most important considerations in creating applications is the size of the market to which those applications will be suited. The applications developer will want to see maximum returns for his investment in development: his programs should be available to as many microcomputer users as possible.

Two factors will enhance the developer's market - the first is the operating system environment.

Resources are frequently stretched during the development phase of an application, and to have to split development to cater for two or more "standard" operating systems is a further unnecessary overhead. Ideally, the application would be developed for one operating system - one used on a large proportion of microcomputers.

The second consideration is the flexibility of applications, their portability across different machines and the ease with which they will cater for different devices supported on each machine.

Memories of patching the CP/M-80 BIOS each time a new device is added to a microcomputer must come flooding back to eight-bit developers when the subject of flexibility is mentioned. Installing new devices has not been the most simple of activities in the past.

Flexibility is also required when moving an application from one machine to another - screen handling, cursor codes and I/O are likely to vary from one machine to another, even under the same OS.

Each application should be insulated as much as possible from the specific features of the hardware it runs on, while being able to take full advantage of the unique features available on some machines.

Having considered the commercial aspects of applications development there remains the development environment itself. It should promote applications development with a minimum of utility and features such as efficient disc use and file organisation, simplified disc I/O, powerful assemblers, linkers, loaders and compilers.

Other desirable features such as powerful I/O commands with easy chaining of commands, are emerg-

ing on the latest operating systems, at the command level. Batch files on these more recent operating systems include tests, conditional jumps and branches and are almost command level programming languages in themselves.

A number of lessons can be drawn from minicomputer operating systems, and flexibility is one of the more obvious. In particular, device independent I/O and installable device drivers.

MS-DOS 2.0, the latest version of Microsoft's 16-bit operating system incorporates both these features, with a great deal of similarity to the Unix operating system - probably the most widely used minicomputer operating system. MS-DOS 2.0 represents one of the most advanced of the new generation of 16-bit operating systems with all of the above features.

The first difference the user will notice with MS-DOS 2.0 is the difference in the BIOS. Instead of the jump table found on previous microcomputer operating systems, MS-DOS 2.0 has a table of device drivers for each device configured with this system. Re-engineering of this BIOS when new devices are added is greatly simplified: the OS simply reads a driver for the new device and incorporates it into the

Programmers familiar with minicomputer systems have regarded the microcomputer development environment as cumbersome and impractical

list of devices at boot time.

Skeleton device drivers are supplied by Microsoft for customisation, and the applications program need only substitute a different logical device name to change the output medium.

The burden of supporting the standard protocols falls on the device drivers, so that the code required to perform graphics functions and other special I/O need be written only once, not rewritten for each application program.

Each device has a logical name associated with it and device drivers are loaded when the system is booted. The system integrator can easily incorporate new and nonstandard devices into the system, or can deliver different configurations to different customers without having to maintain multiple operating systems.

This dynamic loading also allows an unlimited number of devices to be supported on the system simultaneously.

Programs then communicate with the different devices in a uniform manner. Program I/O is treated as communication from one file to another - devices are treated as files. Writing to a device, such as the console, is performed through an I/O stream. This is changed simply by changing the logical device name.

With MS-DOS 2.0, Microsoft has addressed itself to the problem of supporting multiple terminal environments. The ANSI standard terminal control codes have been defined as the MS-DOS standard.

The operating system intercepts the ANSI sequences and converts between the terminal's actual cursor movement character codes and the ANSI sequences. Such an approach does not restrict the kind of terminals that can be used - the

benefits to the portability of applications are obvious.

MS-DOS 2.0 also supports AT&T's presentation level text and graphics protocol. The presentation level protocol is a resolution-independent method of describing in a serial byte stream characters and graphics objects. This means that a graphics image may be stored on disc just as if it had been written to the screen.

One factor, possibly more than any other, prevented true portability of applications in the eight-bit world. Although most machines used 5.25 inch diskettes, there was no disc formatting standard and discs could not be transferred between different machines running under the same operating system. Microsoft has established interchangeable diskette standards, which have been adopted by almost all manufacturers that offer MS-DOS on their machines.

Almost without exception, programmers familiar with minicomputer operating systems have regarded the microcomputer development environment as cumbersome and impractical. They are used to having tools at their fingertips during development, to compare two compiled files, search for strings within files, for example, and to be able to send a number of programs to a compiler without having to wait for each to complete before sending the next and without waiting inordinate amounts of time for each compilation.

At the command level, MS-DOS 2.0 has opened up a whole new set of capabilities for the developer. Commands can now be linked together in a number of ways, and their outputs passed through a number of filters.

Pipes and I/O redirection are just one way of linking commands. Pipes allow the output of one command to be used as the input to another or to pass the output through a filter. Take the following example:

```
dir | sort
```

This will pass the directory listing through a sorting filter, giving a sorted output on the screen. The output of any command can be redirected to a new device or file using the ">" symbol. Thus,

```
dir | sort > sortedlist
```

will output a sorted directory listing to a file called sortedlist. If sortedlist does not already exist, MS-DOS 2.0 will create the file. The command:

```
dir | sort >> sortedlist
```

will again take a sorted directory listing, but this time append the output to the end of the file sortedlist. The command:

```
type sortedlist
```

will print the contents of sortedlist on the screen. In this case, it will consist of two sorted listings of the directory contents.

Sort can be used with a number of switches to sort by file size or by any field in the output. Other filters include a data encryption filter (CIFER), FIND and MORE which will send output to the screen 24 lines at a time.

Any of these commands can be used within a batch file. Batch files consist of a series of OS commands which are executed consecutively. Whereas in previous microcomputer operating systems, batch files consisted of nothing more than this, though MS-DOS 2.0 allows the batch file to become a

small program, with command extensions such as "echo", "for", "goto", "shift" and "if", allowing the conditional execution of batch commands.

One of the biggest headaches to the developers of large programs is systems administration - how to keep track of a number of programs, often up to 200, on a system at one time. The logical drive method employed in earlier microcomputer operating systems, provides only a limited framework for file organisation. A hierarchical file structure, as employed in Unix, has been included in MS-DOS 2.0.

The benefits of this structure are that files can be grouped together in any of a number of directories, and directories can even have sub-directories. The number of "layers" or sub-directories is unlimited, and easy access to all files is maintained by the use of pathnames.

For example, a listing of a certain graphics assembler file "grap" held in a directory called "asmh", which is in turn held in a directory of graphics routines called "pics", would be carried out as follows:

```
type /pics/asmh/grap
```

Moving between directories is



possible with the "cd" command. Thus:

```
cd /pics/asmh
```

will take the user into the "asmh" directory.

Thereafter, the file need not be specified, as it is resident in the current directory. The command:

```
type grap
```

would now produce a file listing.

The features included in MS-DOS have set it apart from the 16-bit operating systems derived from the eight-bit world. The world has moved on from those days and future operating systems will continue to evolve, incorporating more and more powerful features, both for the applications developer and the end-user.

Carl Phillips is a Microsoft technical support manager.

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Although attendance is free-of-charge, we would advise early return of the Registration Slip since we have limited room at each venue.

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'Expert' on show at the Tate

SOME might accuse artist Harold Cohen of plagiarism. Certainly few artists are more prolific, but the drawings that he was signing last week at the opening of his exhibition at London's Tate Gallery were generated by a computer.

Cohen, 55, began as an abstract painter. He started working with computers in 1968 and has produced an expert system which drives a big plotter to generate drawings at the rate of 12 an hour.

Cohen says that his system is much like other expert systems, with a knowledge base containing what he considers are the fundamentals of drawing. "Other expert systems draw inferences, while mine draws pictures," he explains.

Signed copies of Cohen's work on show at the Tate Gallery can be bought for £10. They measure about two feet by one, but there is also a huge mural tapestry, which Cohen enlarged from one of his computer drawings, and coloured himself, if you want something bigger.

On the tapestry are what looks like three huddled figures. "Those are the three wicked witches of Macbeth," he says. "And there are the Virgin Mary and Joseph."

How is a computer able to depict such figures? "It is just a matter of interpretation," says Cohen. "When you look at a painting, you think you see what the artist is getting at. Really you are seeing what you are getting at."

Cohen calls his program Aaron, perhaps because he can see the biblical Aaron in one of his computer drawings. The intelligent knowledge base contains basic requirements drilled into art students like perspective, and the fact that you have to draw a shape smaller to make it look further away than another.

Aaron learns from its drawings by remembering shapes previously generated, and the program attempts to extract some pattern from them. In this way, Cohen says, the program can experiment just like a human artist, and there is no limit to what weird and wonderful shapes it can produce. The machine soon began to produce one shape inside another as a continuous action, even though it had not been programmed to do so.

Aaron is still an infant, Cohen tells me. The eventual aim is to make the program self-modifying. Aaron took nine months to write in the C language, with Cohen himself doing most of the programming. Cohen does not think Aaron will make artists redundant. "It makes me feel very important," he says.

Cohen's is not the only exhibition where the impact of computers can now be seen on the art world. At the Darwin Building, next to the Albert Hall, there is a computer driving a weaving machine, part of the Royal College of Art's degree show.

One of the college's students, Rosemary Moore, designed a program, with the help of Courtauld, to enable complex textile designs to be printed automatically.

The idea is that complicated designs can be printed more easily and more quickly by programming the machine to control the printing process.

Intricate designs (previously only usable for "one-off" prints) can now be produced in mass. The implication of this is a bigger market for more sophisticated designs, and therefore greater freedom of action for designers.



Blind lawyers need no longer rely on others to read out precedents.

Terminal lets blind use data service

JOBS that involve operation of a video terminal are more open than most for blind people. The work can be done sitting down, and now that there are plenty of Braille terminals and printers, it is not surprising that the blind are well represented in the computer industry.

But there is still the problem that Braille terminals cannot yet be linked up to many standard online enquiry systems. Such links are particularly useful for the blind, since printed information is rarely available in Braille.

But blind lawyers at the Ministry of Agriculture are now using a Braille terminal to access legal information on Eurolex, the online legal information service. The service uses the Versa-Braille terminal made by Teleson.

This terminal recently came out top in a comprehensive survey of Braille terminals carried out at Bradford University, where there are several blind students.

The terminal accesses Eurolex just like a standard VDU, except that only one line of information comes up at a time. The enquiry is fed in by touching the appropriate Braille input keys, and the reply is read by touching a Braille output pad just above.

Eurolex offers a library of European case law for legal research, and gives references to text cases for lawyers to use as supporting evidence. Unlike some other legal services, it does not require dedicated equipment to be purchased, and any word processor can be linked up.

Some will run as independent companies, some will be funded by the Department of Industry, while others will be funded by the local authority, local companies, or a combination.

Berkshire's first Itec, officially opened last month, is funded jointly by the county council and Digital Equipment Corporation. There are close links with Reading Chamber of Commerce. "This is to alert local firms that there is an Itec in Reading, and arrange work experience placements," says Barry Deller, who runs the Reading Itec.

At most Itecs, Deller says, 15 weeks of the year will be spent on work experience at companies allied to the scheme. The last half of the course will focus on applications shown by trainees.

There have so far been just times as many applicants as places available, so there is an interview, and IQ test as part of the process to sift out the best.

The Tameside Itec in Cheshire has been open three months, and is jointly funded by the MSO, the Dol and Tameside local authority.

"Already quite a few trainees have been approached by local companies," says director Paul Hartland.

The Tameside centre also gives youngsters training in interview technique, word processing and "the modern office".

Workplace is compiled by Philip Hunter.

NEWS ANALYSIS

Cullinet tries to avoid a takeover

Success could be numbering the days of independence for software companies, as George Black writes

SUCCESSFUL independent software companies are ripe for takeover by technology-hungry multinationals. But a 59% jump in sales and a hefty 52% hike in profits in the last year have given Cullinet plenty of breathing space.

"Anyone who wanted to buy us would probably have to find three quarters of a billion dollars, and then they would find that a lot of the staff would leave," says Vic Morris, managing director of Cullinet UK.

What Cullinet has to offer is brains, Morris says, and if the

One thing they overlooked at first - understandably - was a pricing device. No one ever thought of the problem of too much space. More than most high technology businesses, Cullinet is having to cope with the difficulties of growth, the speed of which is determined more by customer demand than by management policy.

The choice of Stanmore was strongly influenced by customers. IBM sites are not strung out along the Thames Valley, where so many computer firms are making their homes, argues Morris. Crucial factors for an IBM software house are the M1 and the coming M25, not the M4 and Heathrow.

When Cullinet first decided to spread itself overseas, Morris became "our man in England". The products were sold through BP's subsidiary, Scicon, which Morris joined from British Leyland in 1976.

The firm began in 1968 selling the EDP auditor when reportwriters were a new concept and were received very suspiciously in the data processing world. Then it acquired the rights to the IDMS database system, which it reworked from Honeywell to IBM hardware for the American tyre manufacturer B F Goodrich.

By 1979 Cullinane was convinced that working through an agency was not the long-term answer and set up his own British offshoot. Research and development is still centred in Boston.

The British operation consists mainly of a sales team of eight and a technical support operation of 20, with the emphasis on preventive maintenance rather than "fire-fighting".

There are Cullinet offices in Paris and Brussels, where work is in progress on a Siemens version of IDMS. Representation in Germany is through ADY Orga.

Another sign of the changing self-image is the recent advertising campaign. Many computer firms have been increasing their spending on publicity, but most of these are hardware firms and much of the output fairly predictable. Cull-

large part of the problem was just that people didn't want it to be done. They didn't want to co-operate in this great exchange of information."

The coming revolution will bring data processing departments closer to their users, make them less hostile to users' having their own micros and make them spend more time on analysis, less on coding, he foresees.

And the next era is likely to bring a new intensity of competition with the other principals of the software world, such as MSA, Cincom, ADR, Informatica and McCormack and Dodge.

Morris insists they now have the tools at their disposal to be ready for the challenge.

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A COUPLE OF DOUBLE-FACED PRINTERS.



The coming revolution will bring data processing departments closer to their users, make them less hostile to users' having their own micros and make them spend more time on analysis

Cullinet spent \$100,000 in May and June in the UK alone and is preaching software as a gospel.

Software's importance is recognised in the industry - indeed has almost become a cliché - says Morris, but the general public still has to be convinced that it's not just a matter of going out and buying a box without knowing what will make it work.

Morris does not rule out further takeovers, but says these would only happen if the company found it could not satisfy customers with present resources.

Cullinet is on target to release its IDMS/R package, linking IBM mainframes to micros, in December, Morris sees it as one of the major milestones in computing history.

"The old theory that a single corporate database accessible to everyone could not be done has been proved wrong," he says. "A

Both the 8930 and 8931... The tractor feed which allows... accommodates both sprocket fed paper and... A further common feature is the Diablo... compatibility which makes both the 8930 and... compatible with most word processing systems... Ring now for more details.

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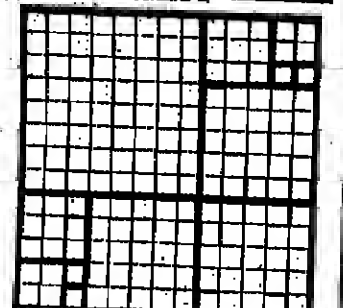


Cohen's creative computer drawing.



Cohen (centre) with his computer at work.

PUZZLER



THIS diagram shows how a 13x13 square grid can be divided up into 12 smaller squares, by means of dissection-cuts which follow the grid lines. Your task is to find a different dissection, once again following the grid lines, in which only 11 squares are used. See page 79 for solution.

Andy is riding high on Tops

FBI up with despatch riding, Andy Jackson applied for a Tops course in ICL Cobol. As that course was full he took another Tops course in RPG II programming for the IBM System 34 mini.

Eight months after graduating, he is earning £7,250 as analyst programmer for the company he worked for as part of his Tops course.

Jackson speaks highly of the course, and would recommend it to anyone wanting to switch from the dole queue to programming. Six of the nine on his course were given jobs immediately afterwards by the companies they worked for on secondment as part of the curriculum.

The only snag is that just 40% of applicants for the RPG II course

are accepted. This is partly because London-based Datasolve, which runs the course, insists on some knowledge of how a business runs. And this rules out a lot of young hopefuls.

Carol Gibbon, of Datasolve, says that the Cobol courses are slightly easier to get into, but the job prospects are not quite so good, with an 80% placement rate.

Jackson thinks he has hit the jackpot with programming. Already he is number two programmer in a team of three for Brox, which specialises in distributing bulk supplies to several large companies.

Most of Jackson's work involves writing RPG II programs to handle order processing for the company and one of its clients. The

ware itself is easy, says Jackson. The problems come when a client wants changes to be made when it sees the final product.

To justify his title of analyst, Jackson maintains a constant dialogue with clients while developing a system.

The company runs British Airways' 435 a year Executive Club. The system stores data on almost 40,000 club members, and has recently run into storage problems, since the System 34 until recently only supported floppy diskettes. These slowed the system down badly.

But the problem has now been solved by a new tape drive added to the System 34 by ICL.

Why computer firms are political footballs

Kevin Cahill looks at how European companies are caught between the US and USSR

A LARGE number of high technology companies do extensive and profitable business with the Soviet bloc and eastern Europe. They include such names as ICL, Quest, CDC and IBM.

Digital Equipment Corp, whose machines have been at the centre of recent "spy" stories about illegal Soviet acquisition of American technology, has an official distributor in Yugoslavia, which is not quite inside the Soviet bloc, but which maintains extensive and close trading links with most of the countries behind the Iron Curtain.

A spokesman for ICL described business with Russia, where the company maintains an office, as profitable and rewarding.

"The Soviets are good business partners. They pay on time and once the bureaucratic procedures

have been observed, business is profitable."

The spokesman added that ICL naturally was scrupulous in observing the various licensing arrangements imposed by the government.

In a more informal moment, another ICL manager remarked with some bitterness that he wished that data processing equipment and the companies which sell it were not used as political footballs.

The view expressed by ICL is reminiscent of that expressed earlier this year by senior executives in Control Data Corporation and in Cray Research when they were visited by *Computer Weekly*.

Few, if any, commercial companies relish the prospect of having their goods or services caught

up in political rows, particularly international rows.

Unfortunately, data processing equipment is now caught up in a divisive, confused and potentially devastating argument between the US and its NATO allies on the one hand, and between the US and the Soviet Union on the other.

The row in the US, which, like it or not, is the manufacturing source of much of the computer technology built in the West, is also deeply reflective of a series of warring departments within the current US administration. Leading the fray with a series of reports now wending their way towards the US Congress is the Department of Defence, the world's biggest buyer of computer technology, with an overall budget the size of the Canadian gross domestic product - \$46 billion.

According to a number of electronics industry executives who have seen these early drafts, implementing them would reduce instantly the export business of all American technology companies by about 50%.

Stripped of its adorning argu-



THATCHER... Didn't complete

ment and illustration, the main report, which has been seen by fewer than a dozen people in the US electronics industry, says that if the technology is used by the US military for any purpose, it should not be exported. Taken to its logical conclusion, that means if the US military use your microprocessor to play games in the PR(NAAFI) you cannot export it outside America.

While most American technology executives are sympathetic to the idea of controlling and monitoring computer and electronic shipments to the Eastern bloc, many of the pro-trade lobby have discovered an entrenched and unmovable DoD backed by the CIA.

While the US producers bewail their looming problems on the domestic front, their counterparts in Europe face far more serious problems.

The European computer producer who is sourcing some or all of his product from the US would face three major problems. His US supplier has to ensure that the goods he is supplying are intended for internal European use and are not on the DoD weapons list, or the Department of Commerce list, which the US military is attempting to yield increasing control over.

In Europe the assembler has to ensure that his final product is not on his own country's list of licensed or prohibited products. The UK has two lists, run respectively by the Department of Indus-

try and by the Ministry of Defence.

Having crossed all those lists, there is a third and last list, which is getting clearance from the Committee for Co-ordinating Exports (Cocomb) in Paris, an access to the US embassy there, which controls all movements of technology between the NATO countries and Japan and the Soviet Bloc.

When President Reagan invoked sanctions against US-based companies over the Iran gas pipeline, even his erstwhile ally, Margaret Thatcher, refused to comply, ordering the UK companies to meet their contractual obligations to the USSR.

Her reason for refusing was simple. No country has as much a right to interfere in its domestic affairs of another country. The US was indulging in what is legally termed "extrajurisdictional", which is the imposition of domestic laws in other countries.

Having failed disastrously with the embargo and caused a major rift inside the NATO alliance, the US decided to use other means to pursue its cold war against the Soviet Union. The means chosen was Cocomb, where the US, at the instigation of the US DoD and the CIA, is trying, so far without success, to establish a military committee to control exports to the Soviet bloc.

The UK in particular has virtually refused to permit the convening of the meeting to consider the matter and there isn't a lot to look to find out why.

The US, in what must amount to a fairly original piece of diplomatic naivety, indicated that the military committee would control a new list which would include all the equipment the US had failed to block for the Soviet gas pipeline.

But the anti-technology shipment lobby has been unable to counter arguments put forward by Dr Ray Currow, now professor of technology management at the City of London University. Dr Currow, quoted in *The Guardian*, cast doubt on the viability of having Russia's missile technology on stolen chips.

The logic here would seem to be irrefutable. What happens to Soviet weaponry if the supply of chips dries up?

There is obviously only one reliable source of chips for Soviet weapons and that is from Soviet factories. And here the argument against the free availability of volume production technology falls down.

It became clear during the attempt to embargo the Siberian gas pipeline that all the embargo could achieve was an acceleration in the pace of Soviet heavy equipment development and a loss of orders and jobs to the West.

Most of the recent cases involving unlicensed computer shipments have related to the most mature and readily available of western technology, like the PDP/11 VAX machines seized in the UK.

What has not surfaced yet is the unlicensed transfer of items such as the IBM 4331, which recently turned up in Poland, or the 3081 in Czechoslovakia.

And CDC supercomputers are legally installed behind the Iron Curtain.

If it is possible for an American company to ship such machines to eastern Europe, why the sudden paranoia about what European technology companies are doing, as few, if any, produce machines even remotely similar to the CDC 7600 and Cyber 205?

INTERVIEW



LONG... Very British.

Honeywell's Long future

IN 1978 Brian Long became the first British national to be managing director of Honeywell's UK operations. He regards Honeywell Information Systems Ltd as being "very British", and points to the fact that Information Technology Minister Kenneth Baker said as much when he opened Honeywell's new Systems Division headquarters last year.

Most American computer manufacturers try hard to push their UK credentials, but Honeywell can give some support to its argument. Through its controls division it has been in the UK since the 1930s. Honeywell Information Systems started in the UK in 1963, and Long says the company has constantly invested in the UK, and constantly reinvested its profits.

In 1982 Honeywell recorded its eighth successive year of growth in the UK, with sales reaching the £100 million mark. Long is proud that even through the recession the company has maintained full employment in the UK - not a situation mirrored in the US, where about 2,900 people were laid off last year. For the past few years Honeywell UK has been among the top performers in the whole Honeywell group.

Honeywell is "very broadly based in the UK," Long says, and is not just "importing and selling". And 1983 marks the twentieth year that Honeywell has been manufacturing in this country, with the 1,000th minicomputer shipped from its Newhouse, Scotland, plant last year.

Before Long took over as managing director there had always been a US managing director and a US financial director. Now Honeywell has an almost totally British team, with the exception of a few specialists. Long, who entered

the data processing industry in his early twenties, took the support to major lines of business. But Long believes that the line of business approach does not get the company close enough to the customer. With so many different business sectors to attack, a national centre to confront individual markets does not make sense. Long says Honeywell has been able to harness the best of both approaches, and indeed points to the fact that a number of

Long emphasises that the UK operation is "extremely autonomous". "We spend a long time agreeing our long range plan with corporate headquarters, but when we have agreed we have great autonomy."

There has been some criticism in the marketplace that Honeywell's technology is lagging behind the leading edge. It is well known that users are always looking for "next year's" technology; but the delay in the release of Honeywell's office automation product is cited as an example of how Honeywell is a year or so behind.

Long deflects such criticism by stating that "we try to bring products to the marketplace when they are ready, and we try to sell what is available."

Honeywell continues to get many new accounts in the UK, which he believes is proof that the company is putting out good products. Certainly Honeywell's users have a high regard for the company, and there seems to be a general belief among them that Honeywell is evolving a co-ordinated approach to meet their growing needs.

While there has been a lot of hullabaloo lately about manufacturers adopting a line of business approach to selling, Honeywell maintains a geographical sales organisation. Long says the company has studied a number of different approaches, and decided that geographical selling remains the best option.

Honeywell provides specialists in certain areas, and gives local support to major lines of business. But Long believes that the line of business approach does not get the company close enough to the customer. With so many different business sectors to attack, a national centre to confront individual markets does not make sense. Long says Honeywell has been able to harness the best of both approaches, and indeed points to the fact that a number of

Telamerica, TR Communications, and Executive.

"I would see similar types of developments in the future. Honeywell may not want to personally develop everything," Long says. The corporate organisation is out "looking around," particularly for collaborations that would strengthen the company in particular niches.

The so-called "niche strategy" has three front runners: networking, office automation, and manu-

communications strategy for the most extensive and complicated networks as well as the most straightforward applications. That strategy relates strongly to its work in office automation, and the FAX situation is being studied closely.

The microcomputer Honeywell will release in the UK next week will be very strong on networking, and represents a vast evolution from the intelligent terminal of only a few years ago. Central to any network will be a powerful mainframe for some years to come. Long predicts - a heavy number cruncher, with communications, networking, and functional software.

The big strength of Honeywell is that it can be very responsive either way. Long says: it does not have to get on the bandwagon for a centralised system or a distributed system since it can provide both. Requirements of different organisations vary according to their internal "culture" - or how management wants to develop the company.

For all its strengths, Honeywell still has some way to go in getting its message across. One never does enough in that area, Long admits, but then he says there is no special magic: one can only be clear on the message.

For the data processing manager, who must be somewhat overwhelmed by the diversity of the computer business, Long sees a number of major issues. He should be thinking about application software, increased programming facilities, increased programming aids, communications and office automation, and in greater portability of software.

Long advises the DP manager to be responsive to the aspirations of the board - which way do they want to go "culturally".

Honeywell can be very responsive... it does not have to get on the bandwagon for a centralised system or a distributed system

companies have pulled back from the total industry method of marketing.

An industry trend which Honeywell is following is the move towards collaborative ventures with other high technology companies. Honeywell continues to hold a stake in the French computer company Cii-Honeywell Bull, although it was decreased last year from 47% to 19.9% in exchange for \$150 million in cash.

Long says the Cii-HB link is still very important to the company. Honeywell gets the DP S7 minicomputer from Cii-HB, and has a 10-year technical and commercial agreement. The arrangement is particularly useful in international deals, Long says.

Honeywell is "very receptive" to collaborative agreements in general, and is talking to the Japanese NEC "to see whether there may be some common ground for co-operation". A number of links have been made in the US with communications companies - Action Communications in Dallas,

facturing, with a heavy applications thrust. In the UK retailing is also a priority. While there are certain corporate objectives, each country will build on its own strengths. An example is Honeywell's involvement with the retailer Littlewoods, the largest UK installation for Honeywell with something like £20 million in equipment.

And it is the niche strategy that Long sees as the way of countering the threat posed by Japanese technology. "Anyone who says Japan is not a threat doesn't understand the business."

But Long is undaunted. "It makes it exciting. It sharpens the edge." He points to Honeywell's strength on the ground, which is the advantage of large, established companies like his own.

One of the niches where Honeywell is having some success is in networking. There is an element of networking in almost all of its sales, Long says.

For the future Honeywell intends to have an "all embracing

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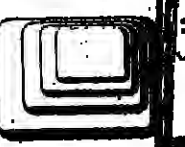
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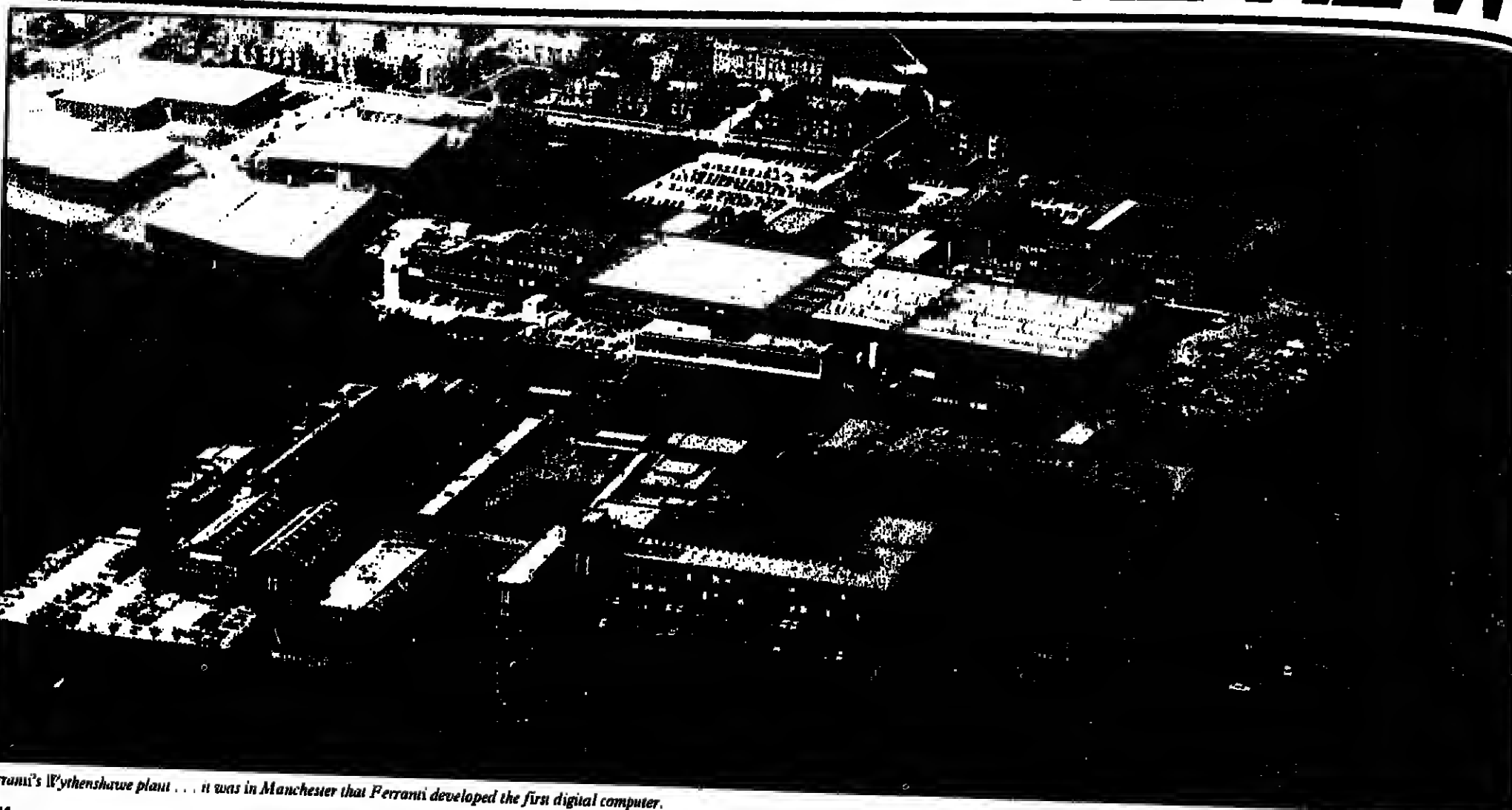


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PT7 THE ADVANCED ALTERNATIVE TO IBM 3270 AND THE ICL DRS

COMPEC NORTH PREVIEW



Ferranti's Wythenshawe plant... it was in Manchester that Ferranti developed the first digital computer.

The north may be swathed in unemployment gloom but Della Bradshaw thinks there's plenty to boast about.

Northern lights Ferranti and ICL shine in the gloom

THE north of England, from Nottingham and Manchester to Newcastle and Carlisle, conjures visions of mass unemployment and gloom. But it was at Manchester University over 35 years ago that the world's first digital computer was developed, and that back in 1950 Ferranti produced the Mark 1 Star in Manchester - Europe's first contribution to commercial computing.

These days the north still boasts some of the strongholds of Britain's computer and electronics industries. ICL, Plessey, GEC, Philips... the list goes on.

The first National Computing Centre in the UK is in Manchester, and the North-West Industrial Development Association claims that foreign companies are also leading for the north - there were 650 of them in the north-west at the last count.

That said, companies in the north have been faced with the "recession" as much, if not more, than firms elsewhere in the UK. Both ICL and Plessey, Britain's leading light in the telecommunications field, have released their annual reports and accounts. Both show encouraging - in Plessey's case massive - profits, but at the cost of jobs.

ICL, successor to the old English Electric computer company in the north, and the UK's last remaining world league computer company - (it is the world's 10th largest) - is the most important of the information technology businesses in the north.

For that reason ICL's recent recovery from the financial collapse, which all but wiped it out in 1980, is vital to the battered economy of the region.

But the price of recovery was very high in terms of employment: over 9,000 of the original 30,000 jobs went, many of them in the north, at Kidsgrove, Winsford and West Gorton.

The Winsford factory closed altogether, adding another empty building to an industrial estate already full of vacant offices and workbenches. The PCB plant at West Gorton was saved by the intervention of Fujitsu, ICL's Japanese partner in high technology for the new computer ranges the company is developing.

But for every job lost, there is now hope that new ones will be created as ICL's participation in the recession-proof growth of the computer industry begins again.

Exactly 20 years ago the Atlas division of Ferranti built and delivered the Atlas 1, the biggest mainframe in the world in its time. The computer, which took 19 trucks to move to the Rutherford Appleton Laboratory at Swindon, was a one MIP processor, with 48Kbytes of main memory.

Two months ago ICL delivered an Atlas 10, in one truck, to the same laboratory. The new machine, with a processing power of 15 MIPs, had 32Mbytes of main memory but was built in Japan.

However, Robb Wilmot, ICL's managing director and architect of its recovery so far, sees the Atlas as a tactical machine in the strategic battle to win IBM business and keep ICL in the big machine market.

When Wilmot took to ICL in 1981, the company was suffering a cash drain that seemed destined to destroy the organisation. Wilmot's options were extremely limited, and harsh though they were, they

have kept the company sufficiently in business to contemplate two vital new machine ranges, the DMI and the Estrel.

The DMI is a small mainframe which will succeed the very successful ME29. The chips for the new machine will come initially from Japan, but the entire unit will be built in the north, at West Gorton.

That will bring new jobs to the north. Exactly how many is very difficult to say, but if the DMI is half as successful as the ME29 the number will be substantial.

But the DMI at two MIPs is

which was developed by ICL - again in conjunction with Manchester University.

The chips for the Estrel CPU will come from Japan, from Fujitsu, but the extent of Wilmot's commitment to bring computer manufacturing on a large scale back to the north can be measured by the fact that, of the 75,000 sq feet of PCBs needed in one year of manufacture of the Estrel, less than 2,000 sq ft will come from Fujitsu. The remainder will be built in West Gorton by ICL.

Plessey is also in a similar position. It recently announced £146

sew made both its turnover and its profits last year. Teleconics accounted for 47.2% of the turnover - up from 43.5% the previous year - and 56.8% of the profits.

Edge Lane is not Plessey's only set up in the north. There is also the Chesapeake works in Liverpool, which make microelectronic systems, the Lamberhead Green factory in Wigan, which makes telephone equipment, and the Beeston works in Nottingham.

But the bad news in terms of jobs for ICL and Plessey is not necessarily detrimental to other companies. United Peripherals is a case in point. The disc and memory manufacturer was set up about three and a half years ago in Winsford, in the factory which ICL had decided to close down.

The 27-acre site cost Data Recording Instruments, the holding company for UPL, nearly £7 million - about a third of what the factory was worth.

UPL had originally intended to set up in Crewe, and had already spent £200,000 on a site there. But the move to Winsford saved 550 of the 1,000 or so jobs that the departure of ICL created - even though UPL now has a factory which is about 100,000 square feet too big!

UPL is now set to deliver £28 million of products this year; mainly two hard disc drives, the 14 inch Hawk and the Phoenix. A design group at Winsford is working on the "Windsor" disc, an eight inch fixed disc with a thin film head and capacity of 200 Mbytes. That will be marketed in the US by Control Data Corporation (CDC), as well as in the UK.

Peter Gregory, chairman of UPL, says shares in UPL are ex-

pected to be sold privately in about 18 months. At the moment UPL is part financed by CDC, which has 24% of the equity, and the British Technology Group (BTG) which injected £12 million of cash just over a year ago.

UPL is certainly one of the BTG/CDC success stories, but does not rank quite yet with the other blue-eyed company of the BTG/CDC partnership - Systime. Since its formation in 1972 in Leeds, Systime claims it has become the largest supplier of turnkey systems in Britain.

In the past eight years the firm has expanded from a £1.2 million turnover a year set up to a £4 million a year company, and is constantly expanding its factory space. Only a year ago it announced another £20 million plan to build another factory, now completed and opened this month.

Systime currently employs about 1,400 staff, and intends to create another 80 jobs in the next six months. And if that is not enough the firm is still expanding at 40% a year and has an expected turnover of £60 million for the coming year.

CDC now owns 40% of Systime - it is the biggest single shareholder in the company - and has injected £8 million in capital. Systime will probably go for a stock exchange listing in the next six months.

Systime currently exports about 30% of its products, and has a nationwide servicing operation for the other 70%. Being centred in Leeds, Systime claims, has positive advantages. "If you look at a map you'll see we're right in the middle of Great Britain," claimed

Continued on page 25

COMPEC NORTH

Companies show the north can thrive

From page 24

a spokesman for Systime. "We're on all the major motorways and the airport here at Leeds is being extended, so in two years time it'll be one of the major airports in the UK. I'd like to think they're doing that because Systime is here, but I don't think I can really claim that."

Another company that does not seem to think marketing was any problem from the north of England is Gandalf, the Warrington-based data communications company. Gandalf was set up about 10 years ago and now has a staff of between 80 and 85 people. It has a field services department in Middlesbrough, but all its main business is done from its sales department in Cheshire. "We have no problems at all centring our marketing on Warrington", said a spokesman for the company. "If customers want modems or multiplexers then they come here to Warrington for them."

One company which is a little more dubious about the advantages of being based in the north is Derwent Data Systems, which set up in Sunderland in April 1981 as a one man outfit. Since then the company has expanded to a staff of about eight, writing software packages for CP/M and MSDOS micros. The best known of those is the database management system Retrieve, but accounting, financial modelling and word processing packages are other products. As well as software distributors Derwent Data Systems also claims companies like ICL and NEC among its customers.

"Is being in Sunderland a disadvantage when it comes to marketing? Yes and no," said George Perfect, the founder of Derwent Data Systems. "Our software goes to software dealers and to computer companies. At the dealer level they don't really care where you are - once the software has been demonstrated to them then we just post it to them."

"Most of the computer companies are in London, though, so to do business with them we have to physically travel. That said, we are very conveniently placed for doing business with Scotland - it's been a positive advantage."

Derwent Data Systems is also looking abroad. Perfect claims that up to 75% of the firm's income this year will come from exports, especially to the US and Australia. "And it's just as easy to sell software abroad from Sunderland as from anywhere else in the country," he claimed. "Just because companies are in Sunderland doesn't mean they can't grow or expand." Just so - his company is expecting a turnover of up to £34 million this year.

Good news in the north is not just limited to the mini manufacturers like Systime, though. Micro vendor Keen Computers in Nottingham is also on the success trail.

Tim Keen, managing director and founder of Keen Computers, started the firm to write software packages for Apple micros. But things have expanded. In 1979 Keen took on two American products to market - the Onyx microcomputer and network products and storage devices from Corvus systems - to market.

About nine months ago the company set up an independent software house, Atlantic Software, to market software on both sides of the Atlantic and in Australia, and Systime will probably go for a stock exchange listing in the next six months.

Keen is not short of big name customers, either. British Telecom placed in order two months ago with Keen for Flexus computers running Unix for development of the System X digital exchange.

Overseas micro manufacturers are also setting in the north. The Japanese firm Sharp established its

and has not looked back since. In 1977 it had a turnover of £31 million in the UK, and by 1981 had increased that to £100 million. All that income is for sales in the UK - Sharp does not use Great Britain as a stepping stone for Europe.

And things are still on the way up. A new warehouse is due to be opened in August to provide an extra 600,000 square feet - that will cost another £1 million to the £2 million Sharp has already spent on construction in the UK.

Commercial backing is there for northern micro manufacturers, too. Positron in St Helens is a case in point. It was the first company to be backed by the BTG's Anglo-American Venture, which aimed to bring technology from America under licence for manufacture in the UK. But Positron went one step further and designed its own micro - the 6809-based Positron 9000.

The machioe, launched last September, operates under OS/9, a Unix-based operating system designed especially for the 6809. It is aimed at "systems integrators waiting to move down from minis" according to Ian Kendrick, who is in charge of dealer support at Positron.

And it is not just a question of companies setting up in the north and selling their products in the south. The London Stock Exchange is the heart of the nation's financial centre; nonetheless 37% of all business conducted on the stock exchange is processed in a relatively tiny bureau in Nant-

"It's just as easy to sell software abroad from Sunderland as from anywhere else."

wich, Cheshire, by NMW Computers.

NMW is very definitely a northern firm. Not only does its managing director, Brian Johnson, come from Manchester, so do its two ICL 2972 mainframes. And its front end processors, both Ferret machines, come from down the road in Wythenshawe. NMW's operations saw a profit of £300,000 last year on a turnover of just £2.9 million, and this year profits are expected to hit the £1.2 million mark. Just in case things do not go too well, NMW keeps a kitty on deposit - of £1.5 million.

NMW has not done too badly at showing the stock exchange how to keep its house in order, either. Johnson spent £3 million to develop Capital, a system to run the London Stock Exchange business. The Stock Exchange also built its own system, "Talisman", and that cost them £17.5 million.

NMW is currently involved in testing an intelligent terminal which is designed to download the contents of the NMW software into the offices of the stockbrokers who use its services. From a staff of seven in 1972 NMW now employs 80 people, and also provides all of the key members of the Dublin stock exchange with their computer services.

Another very "northern" company, and a "northern" company of more vast dimensions, is Ferranti. Like ICL, Ferranti was rescued by the old National Enterprise Board (NEB), and since then has brought substantial prosperity to the north.

When Ferranti hit the financial rocks it was a specifically "financial" crisis - but it was eventually proven when Derek Alun-Jones recovered the company without the loss of either a single board member or a single senior manager.

The company lost very few jobs,

even at the time of the crisis, and has increased employment ever since. Ferranti now employs the majority of its employees in the north of England and more than 25% of them in jobs that have been created in the past five years.

The company continues to manufacture computers, mostly for military purposes, though there is a thriving commercial division based at Wythenshawe. The main products produced by Wythenshawe are the Ferranti F7 intelligent terminal and its minicomputer. Alongside the standard products Ferranti also produces a range of specialist systems, such as whole telemetry and data processing systems for oil rigs.

And it is these specialist applications which are perhaps the heart of Ferranti's business, according to Derek Alun-Jones. He sees the company as an organisation of specialised skills, which partly explains why Ferranti has never become a bulk supplier of standardised boxes.

He sees the company securing its future through the application of these skills, rather than as a mass producer and manufacturer - despite the fact that the company is of course a major manufacturer. In one area in particular Ferranti has gone out applied its electronic design skills and led the world.

This is in uncommitted logic arrays. Based on little more than a one third share in a government grant of £10 million, Ferranti now has 30 to 40% of the world market in these devices with design offices in the UK, US and Hong Kong.

Apart from the new factory which Ferranti has opened this month in order to become its own primary supplier of the designs produced, it employs 1,700 people in its ULA divisions. The factory, housed in an abandoned Remploy building, took exactly one year from purchase to production, and cost little over £10 million.

Ferranti also reveals its profits this week, and there are no prizes for guessing that the company is going to be very positively in the black - an expected £380 million on a turnover of £380 million.

And when it comes to winning prizes, there is a Bradford firm which knows exactly what it is doing. Microvitec, the maker of colour visual display units, picked up a cheque for £25,000 from the Hill Samuel Anniversary Awards competition last November, and then completed the rounds by adding a silver cup and £15,000 to the coffers by winning the Bowater Industrial Achievement Award the following month.

On the software side there is a company based in Manchester with a name to fit the bill, Northern Software. Northern Software is not bad at picking up prizes.

Founded in Manchester in 1970 Northern Software has won ICP prizes left, right and centre for the popularity of its software packages. They include packages for accounts, in particular including VAT calculations - NSC receives £50,000 of orders for its packages in 1973 when VAT was introduced - and for compilation exercises.

The latest package, introduced in January this year, is a real time database accounts package, and was launched amid a flurry of controversy and backbiting. Howard Sherrington, managing director and founder of NSC, claimed that any company that bought an accounting package that was not database or real time would find it had bought an obsolete package in a few years time.

"Anyone who buys this type of package is wasting their money," Sherrington claimed. Needless to say several other companies producing accounting packages had very different opinions!

More Compec North on pages 34 and 35.

Northern people...



GREGORY... His UPL took over ICL's Winsford factory.

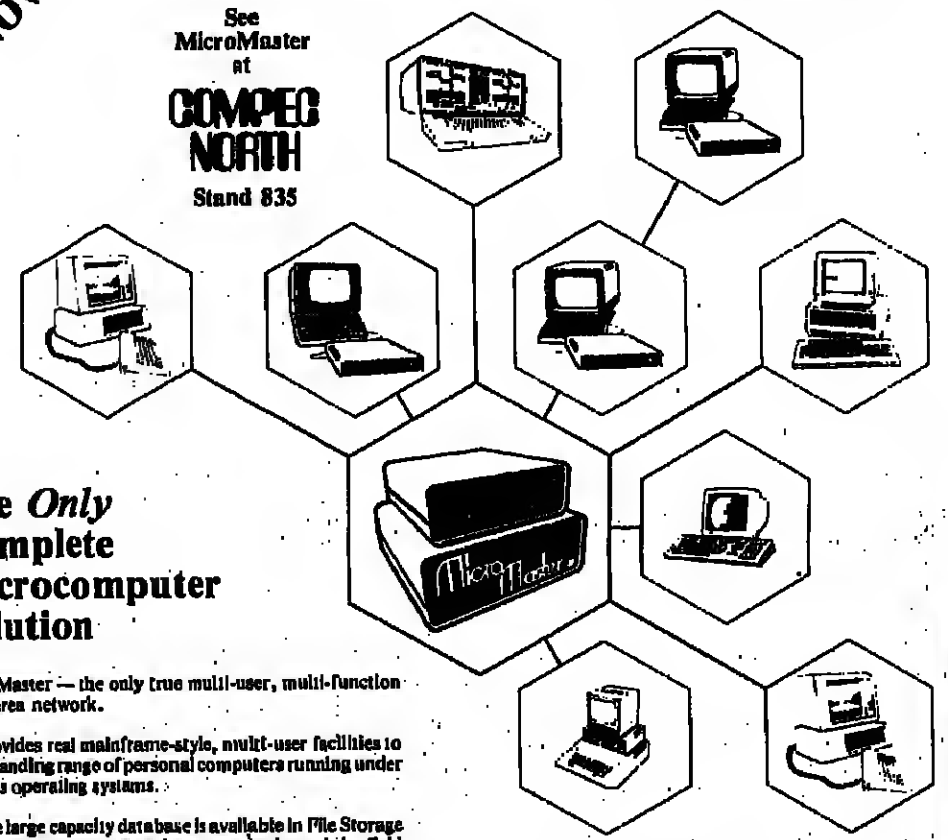


ALUN-JONES... His Ferranti is one of the north's successes.

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Switching on to the optical system

A radical rethink is required of those who believe the computer to be an intrinsically electronic engine, according to Robert T. Street

ABOUT two years ago headlines in the Japanese Press heralded, with the usual exaggeration, the advent of the "optical computer" which would be capable of working at close to a trillion operations per second ("one trip" perhaps?).

But, unlike the usual Japanese trumpeting, this was not a Japanese invention. It was nothing to do with a Japanese company and was not remotely related to Japanese technological research.

More prosaically and in fact, nobody had invented an optical computer, but a team at Heriot Watt University headed by the Dean of the Faculty of Science, Professor S. Desmond Smith FRSE were well on the way towards designing a series of devices which would make such a pipedream quite a lot closer to realisation.

To see how close would require some radical rethinking by those who believe the computer to be an intrinsically electronic engine.

It couldn't be, since the base needs are a form of switching, by present-day needs, from binary one to binary zero and back. A group of these switches registering ones or zeros act as memory and can be the fundamental of the controlling mechanisms.

How these switches are implemented doesn't really matter in logical terms, but is certainly important when speed is of the essence. It's quite possible to have a hydraulic computer working with oil, water or any other fluid. It's faster to rise valves as switches, as the bulky mainframes of the 1950s did.

Speed is really increasing when transistors are used and will approach the ultimate if light is applied as a switching medium.

But how can light be used as an on-off mechanism? The answer, in short, is the use of a laser and interference in the intensity of the light beam it produces as it enters a crystal. If, on entering the crystal, changes in intensity can ensure that the quantity of light reflected back also changes from large amounts to very small ones, with corresponding changes in the amount of light going through the crystal, then the basis of a switch exists. In other words we have an "optical transistor".

Professor Smith and his colleagues, with doubtless Star Wars and Blake's Seven reasonably fresh in their minds, have christened this optical transistor a "transphosor", even though, less romantically, a change of light phase is involved.

To make it practical, you need not only certain crystals but a

means of control. The crystals of certain materials change their refractive index when light is shone on them with different intensities. If you stand in front of a plate glass window, then your reflection is going to be clearer or not so clear, partly as a result of the intensity of the sunlight you're standing in, although no change of refractive or bending index is involved here.

The bending effect of the medium, in the case of the transphosor, a crystal, is comparable in some ways to the bending effect of water droplets which produce a rainbow. The different parts of white light are, in effect, slowed down relative to each other, by the effect of the substance through which they pass - that is, in the rainbow's case, water, giving the well-known multi-coloured spectrum.

To get a better idea of how the transphosor works, there is nothing better for illustrative purposes than an ingenious device called the Fabry-Perot interferometer, a rather forbidding name for a widely used piece of apparatus, where everything is done by mirrors. Its original design intention was to measure the wavelength of the various colours of light.

The simplest form of this device is a pair of plane mirrors parallel to each other and separated by a space. Any material which transmits radiation with the wavelength of interest is inserted into the space, which acquires the name "cavity". Each of these parallel mirrors partly reflects the incident light and partly allows it through - as in the case of the light from your body when you are standing in front of a plate glass window.

Suppose this plate glass window has another which is exactly the same located behind it, thus forming the two parallel mirrors of an interferometer. If the plate glass window you're looking into reflects 90% of the light (in other words it's one of those semi-reflecting ones) and allows 10% through, then the rear plate glass window which you cannot see will get only 10% of the light. If this rear plate glass window has precisely the same properties as the one you're standing in front of, it too will reflect 90% of the light and allow 10% through.

This bouncing of light from front to back goes on with the amount of light getting weaker each time until it finally fades out. The forward beam, through the first plate glass window and the reverse beam, back from the second can be treated as light

A working device within four years is the aim

JUST what an optical computer will be like is a matter of guesswork, but one area which could benefit is that of parallel computing. This arises because, compared with an ordinary electronic transistor, there can be several switching currents from a laser which will not get confused, because of the nature of laser light, whereas with a transistor it is difficult to use more than one current. The transphosor could have several beams through it after splitting an original signal beam into several parts.

How long before a working optical computer is available? Professor Smith and his colleagues are understandably cautious, but they are willing to say

that they will have some sort of working device, not necessarily a computer, within four years.

The main problem currently and the area at which maximum investigation is being pressed, is that of finding a suitable material. Indium antimonide is excellent for switching from what would relatively speaking in the reverse direction. The actual times appear to be a few picoseconds upwards and a 100 nanoseconds downwards.

As a result of this research, little work has been carried out on costing, but Professor Smith and his fellow researchers are very optimistic on this score, although, they stress, it is early days yet.

waves propagated through the cavity, the space between the two windows.

The interaction of these two beams is crucial for design of the transphosor. The result of any interaction between forward and reverse beams depends on the alignment of the crests and troughs of the light waves. Crests can align with crests and troughs with troughs and there can be any variation from this total alignment to the reverse, total disalignment, where crests are aligned with troughs. Crest with crest is called constructive interference with a large amplitude and the opposite is destructive interference with correspondingly a small amplitude.

The actual final alignment can be made to depend on the material in the cavity - air in the case of the plate glass windows, but in the

interferometer itself, any material can be placed in the cavity. By choosing a material with the right refractive index, forward and reverse beams can be made to interfere with each other as required. For example, if a certain type of glass is used, with a refractive index of 1.5, as the material in the cavity, then light travelling at 300,000 kilometres per second in a vacuum would be reduced to a speed of 200,000 kilometres per second in this glass. Slowing of light is accomplished by a reduction in the wavelength, but the frequency stays unchanged.

If the material in the cavity is then altered, a different amount of light is reflected and the refractive index changes. So this change of material in the cavity provides the basis for a very clumsy optical switch.

However, it has been found that

the refractive index, resulting in changes in the transmitted and reflected portions of the light, can take place as a result of changes in the intensity of the light, in certain materials. In more scientific terms, these materials have a non-linear refractive index in relation to the intensity of the incident beam of light. This fact became particularly apparent when the laser appeared.

By shining laser light on a material with this non-linear refractive index and gradually altering the intensity of the laser light, a point is reached where the incident beam and the changing refractive index conspire to form positive feedback, giving a transmitted intensity of not far off 100% of the incident beam's intensity.

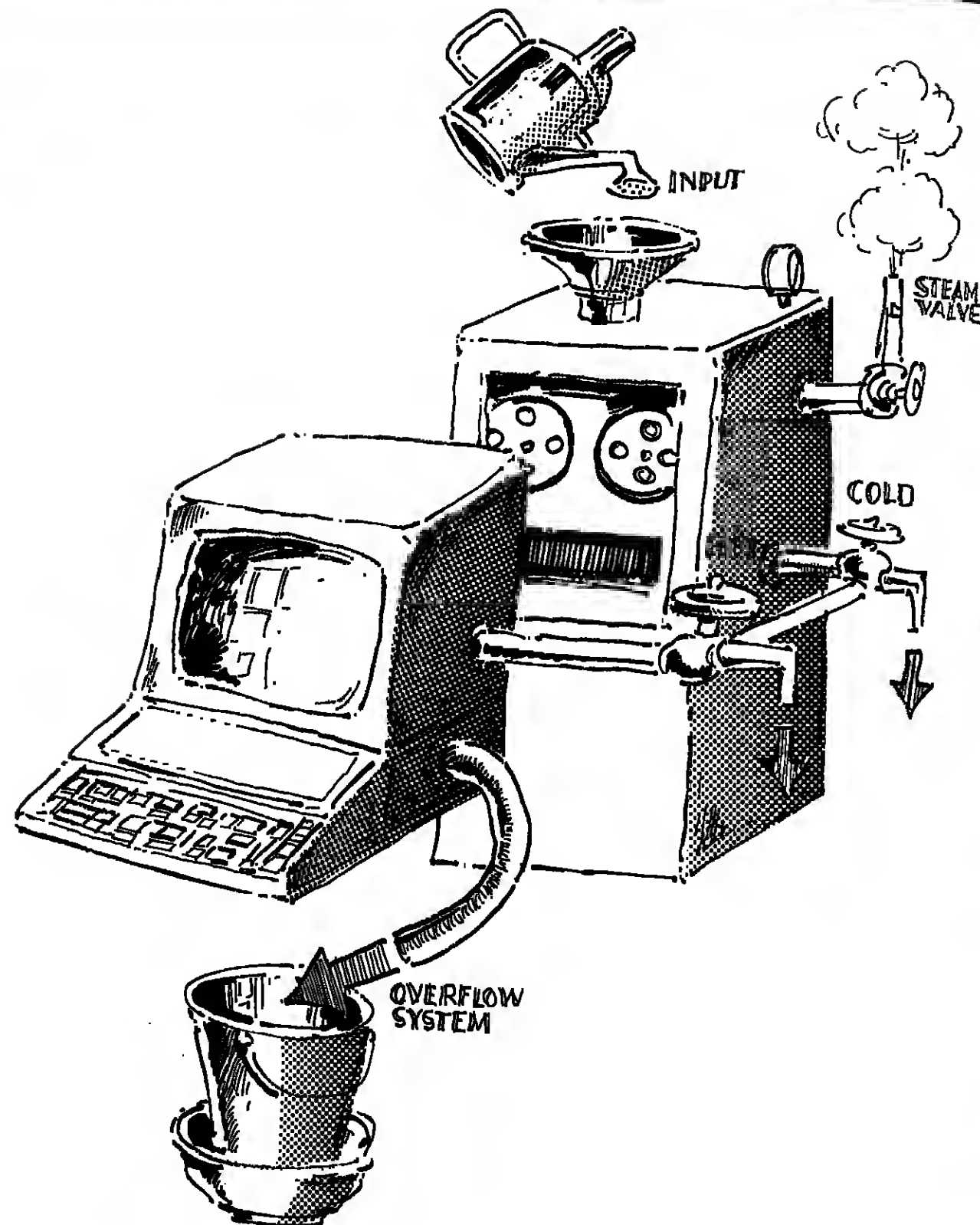
It is found that reduction of the incident light from this peak does

not result in linear reduction in the transmitted light's intensity, but continuing diminution of incident intensity will reach a point eventually where the refractive index and the intensity in the cavity reach a stage of opposition. At this point, there is a sudden drop in the transmitted beam's intensity.

This is typical of the so-called bistable optical devices where there are two stable regions, one when increasing the intensity of any incident beam and one when the intensity of that beam is decreasing. In each of these stable regions, the amount of light transmitted changes very little with changes in the intensity of the incident beam, until a point is reached corresponding with the end of the stable region, where a very little alteration in the intensity of the incident beam will produce a very considerable change in the transmitted beam's intensity.

They are called bistable because of the existence of the two stable zones. The problem now is to find a material which provides bistability of the type required. Professor Smith and his colleagues have carried out a great deal of research into this area and have been using indium antimonide as the experimental material. This substance allows the promotion of electrons from one band to another, near the crystal causes them to scatter to other close-by energy levels. This promotion and the subsequent scattering is the reason why the refractive index of antimony antimonide to alter.

The author expresses his thanks to Professor Smith and his colleagues for their help.



PEOPLE

Fortune Systems has appointed Garth Selvey (below) as UK distribution manager. He will be responsible for all liaison with Fortune's distributors and its dealer network, and will coordinate marketing, promotions and exhibition plans. He joins Fortune Systems from Intel International (UK), where he was responsible for sales, administration and technical support for European distribution accounts as European account manager.



Comart has appointed Roger Tucker as sales administration manager. He has more than 15 years' experience with high technology companies, having previously worked with Cambridge Instruments and Ling Dynamics.

Ian Farmer has joined Xionics as distributor network manager. He has previously worked for AES, Rank Xerox and SCM, in sales and training. His last role during his three years with AES was as UK sales training manager.

Peter Edwards has been appointed sales director of the hardware maintenance division of Software Sciences, which is part of Thoro EMT's information technology division. He was previously

with Computer Field Maintenance, which he joined in 1973 as on-site maintenance manager. He moved into sales and was regional area manager before being promoted to UK sales manager in 1982.

Phil Stapleton has been appointed vice president and director of business development for National Advanced Systems (Europe). He returns to London after spending two and a half years at National Advanced Systems' headquarters in Mountain View, California, as director of strategic planning.

Mike Bateson has been appointed marketing director for Ericsson Information Systems. He will be responsible for all sales and marketing activities. Bateson joined Ericsson in 1981 to spearhead its planned expansion in office technology within the UK.

Raymond Harrington (below) has been made manager of the Co-operative Insurance Society's data processing department. He was systems development controller with the company for about 14 years.



Future Technology Systems has appointed Dan Reid as OEM sales manager. Based at FTS' newly opened offices in Knightsbridge, Reid will be responsible for major OEM sales throughout the United Kingdom. He joins FTS from recent experience of small dealers and micro systems houses. Before this he was with Rair.

Alf Glückman has been appointed managing director of Enator (UK). He joined Enator AB, Sweden, in 1980, and has been chief consultant and account manager for the company's major clients.

Ken Johnson has been appointed customer engineering manager of Memorex UK. He was previously the company's customer engineering services manager for over four years where he was responsible for the technical support for users of Memorex equipment.



Mike Dowler (above) has joined Newbury Data Recording, which was formed last year by the merger of DRE and Newbury Laboratories, as European OEM sales manager. He originally left DRE two and a half years ago to become southern sales manager for Teron Display Systems.

John Mostyn has joined Michael Jackson Systems as a consultant and lecturer. Formerly with the education division of Altermo, Mostyn was responsible for the development and presentation of courses in PL/I, program and systems design, IBM operating systems and microcomputers.

Integra has appointed John Anderson to spearhead the sales of its Mobile Office product, based on the Epson portable computer. He was previously with petrochemical engineer MW Kellogg as manager of training and development.

Paradyne has appointed Mike Bisb as field engineering manager, Europe. He will be responsible for European field engineering, European logistics and the establishment of a European product support group. He joins Paradyne from the Digital Equipment Company.

"Backlog cut from £1.4 million to £0.2 million."

"On time delivery up to 98%."

Gerry McLaughlin, Materials Manager, Cyanamid of Great Britain Ltd.

MRPS Proven success in the UK

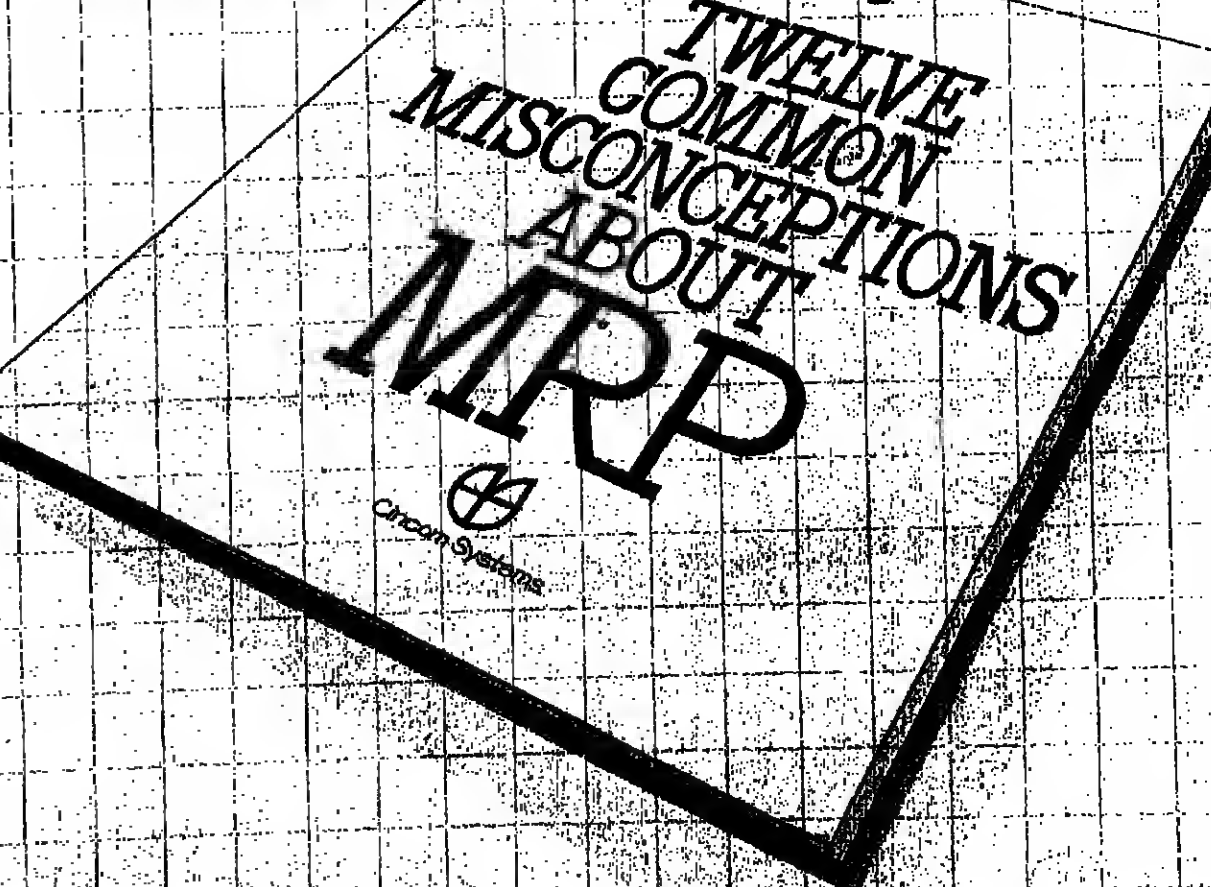
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For further information, the Cincom productivity bulletin on the implementation of MRPS at Cyanamid or a copy of "12 common misconceptions about MRP" contact: Jackie Duncan, Marketing Services Cincom Systems (UK) Ltd., St Ives House, Maidenhead, Berks SL6 1QS Tel: Maidenhead (0628) 72731

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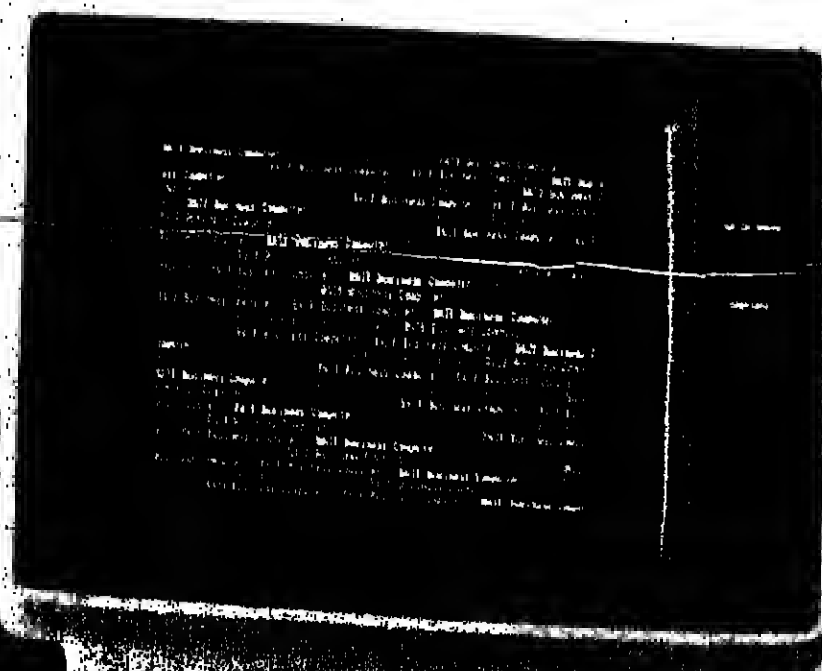
Keyboard: Ergonomic, low-profile, 83 keys, 10 programmable function keys, 10-key numeric keypad (with cursor/editing functions)
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CP/M and MP/M are trademarks of Digital Research. PC-DOS is a trademark of IBM.

the RAIR Business Computer.



PRODUCTS

Desk is designed for micros

THE Panto computer desk from Office and Electronic Machines is designed for microcomputers and word processors.

The desk has separate levels for the display and keyboard and a unit to support the printer. Both units are 80cm square.

The units have steel frames and adjusters to compensate for uneven floors. They are finished in beige, non-reflective laminate and have rounded edges.

The display and keyboard unit alone costs £329. The complete desk, with the printer unit, costs £493.

Other items in the Panto range include drawer pedestals and storage units in laminate or wood veneer finishes.

Office and Electronic Machines (CW), 140/154 Borough High Street, London SE1 1HH. Tel: 01-407 3191.

Cabinet decision

CABINETS for Digital Equipment processors have been launched by UK systems house Computer Systems and Products. The company is European distributor for the Trimm range of cabinets for PDP and Vax processors and RX and RL subsystems.

Top-loading and front-loading cabinets are available. Outside dimensions are 41.64 inches high by 21.25 wide and 30 deep. Inside dimensions are 35 inches high, 19 wide and 26.75 deep.

Trimm cabinets for other manufacturers' equipment are available and there are also desks, work tables, printer stands and other furniture.

Computer Systems and Products (CW), Barrasford House, Goldsmith Street, Nottingham NG1 5JY. Tel: (0602) 415155.

Image offer to BBC users

IMAGE analysis for £295 is offered to BBC microcomputer users by Digitihurst. The company's MicroByte interfaces a video recorder to a BBC model B to allow images to be captured on disc or a printer. The package includes software to enable the user to analyse the captured images.

The resolution is 128 picture elements by 128 on the BBC machine, although the package can also provide a resolution of 256 by 256. It can be run with other leading microcomputers from the likes of IBM, Sirius, Apple, Commodore and Research Machines.

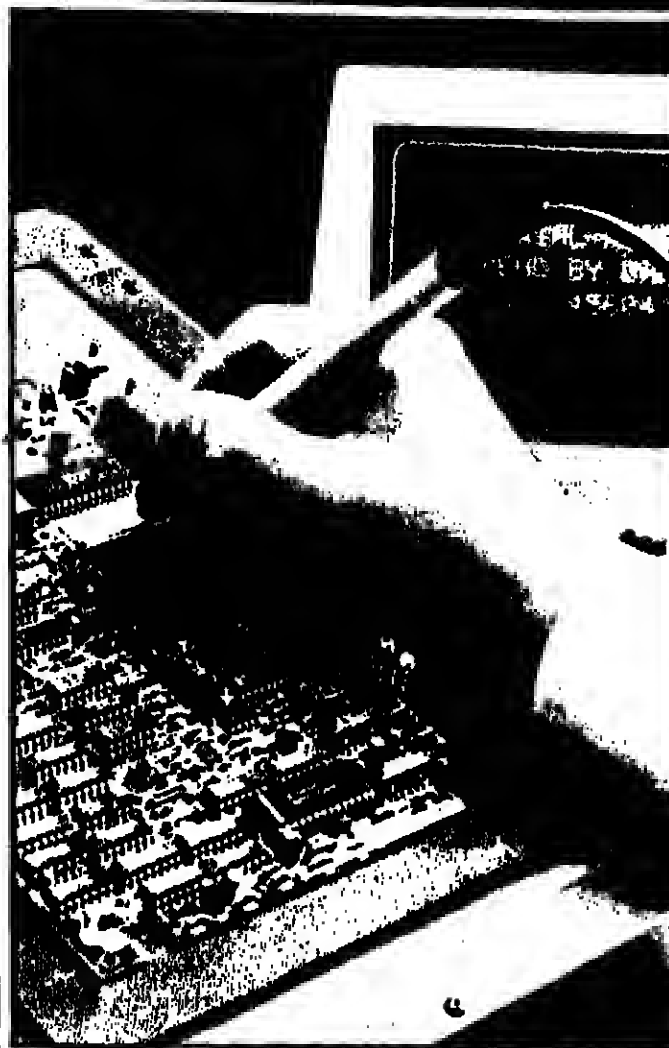
Digitihurst (CW), Leaden Hill, Orwell, Royston, Hertfordshire SG8 5QR. Tel: (0223) 208926.

Combined features

A GRAPHICS terminal for Digital Equipment users which combines DEC VT100 facilities and Tektronix 4010 features has been introduced by the UK manufacturer Lynwood Scientific Developments. The product is based on Lynwood's Alpha Graphic terminal.

Lynwood points out that DEC users normally have to install a Tektronix display to get graphics or put an extra board in an existing DEC terminal to emulate the 4010 software.

The Lynwood product combines the features as a range of software options. Lynwood Scientific Developments (CW), Coker Stream, Mill Lane, Alton, Hampshire GU34 0JH. Tel: (0246) 52929.



The Membrain Model 9300 bar code reader.

Preferred reader named by Membrain

A PREFERRED type of bar code reader for use with the company's MB3300S series of ATB has been specified by Membrain.

The bar code reader, integrated with the test system, allows fast error-free entry of data such as board type and serial number, and can call and control test programs, says Membrain. It simplifies test system operation and improves the confidence and integrity of data logging and test result analysis.

Another application for bar code readers is the introduction of a "paperless" computer-documented PCB repair loop. Before a board is tested, its serial and batch numbers are read from the board label and input to the log file. The board is then tested, and faults are listed in the log file.

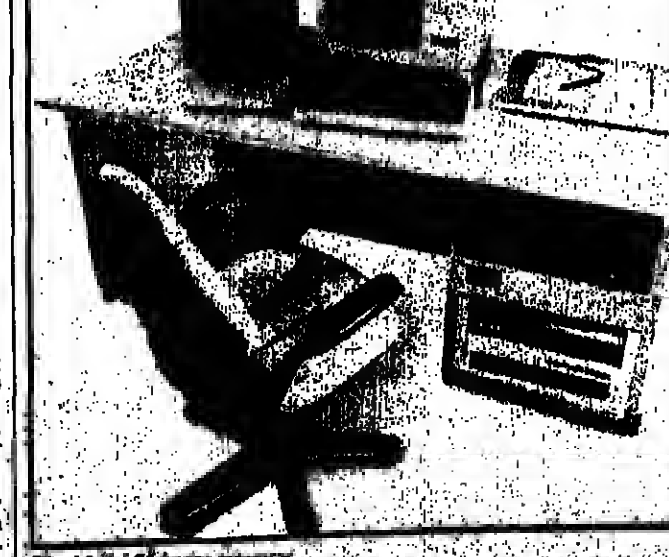
Graphics controller

INTEL's graphics controller is now available in the UK from Marconi Electronic Devices. The Intel ISBX 275 video graphics controller enables users to add a black-and-white or colour display facility to an existing system "with minimum cost and effort".

The device is supplied as a board measuring three inches by seven. It provides a self-contained bit-mapped graphics subsystem for a 512x512 black-and-white display or a 256x256 eight-colour unit.

Marconi says the relatively low cost and simple installation of the controller makes it possible to introduce graphics to applications such as videodata, business information display and industrial operator stations.

Marconi Electronic Devices Distribution (CW), East Lane, Wembley, Middlesex HA9 7PP. Tel: (01) 904 9303.



The Intel Model 75 image processor.

Getting value from business programs

LAUNCH of a range of business and instructional programs designed for Commodore home computers is announced by Marketing Micro Software.

The business program PractiCalc is a professional spreadsheet for Commodore 64 and Vic-20 users. With a clear on-screen appearance and four-colour display, it performs over 20 mathematical calculations as well as row and column operations. It could, for example, calculate the best value for money from a range of different insurance policies where many factors need to be evaluated simultaneously.

Functions not usually possible on a spreadsheet within PractiCalc's price range include fast seek and search, for either individual areas or throughout the spreadsheet; sort, both alphabetically and numerically, either from lowest to highest or vice versa; and a graphics facility.

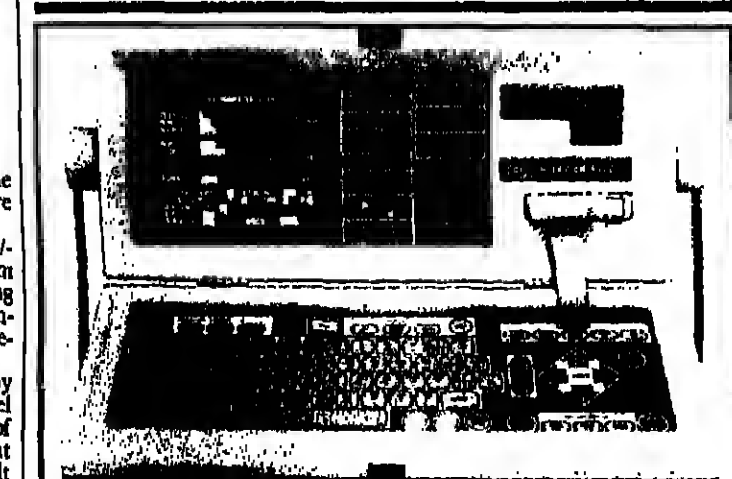
"For the first time, spreadsheet software has caught up with recent developments in hardware," said Richard Sumner, sales director at Marketing Micro Software.

"PractiCalc will run on a Vic-20 with only 16K, yet this easy-to-use package offers virtually as much in everyday problem solving ability as programs costing three times as much."

Written in a combination of machine code and Basic to accelerate entry and display, PractiCalc is available on disc or cassette, priced at £29.95 and £24.95 respectively.

A new instructional software package for the Commodore Vic-20 is the menu starter program Vic Pak. It contains Mortgage, a program that finds the unknown quantity for the deposit, monthly payment, total and annual interest of a mortgage loan; Elements, a quiz on the chemical elements; Statistics, an introduction to the computer as a sophisticated calculator; Calendar, producing selected dates from 0 BC to 9999 AD; and Musicstat, illustrating the computer's ability to calculate probabilities and chance.

Marketing Micro Software (CW), Goddard Road, Whitehouse Industrial Estate, Ipswich, Suffolk. Telephone: 0473-462721.



The DDCMP multifunction monitor.

Automatic monitoring

THE Interview DDCMP (Digital Data Communications Message Protocol) emulator/monitor from Interleuk Electronics is claimed to provide automatic monitoring of the DDCMP protocol tree, control information decode and emulation capabilities at the link level of Digital's DECnet.

Special trigger conditions are provided for DDCMP monitoring and emulation. Checks for good or bad headers, or data segment block checks, are made independently. While in emulation mode, checks are made for outstanding messages or message numbers received not equal to the expected message.

The facilities on the emulator/monitor permit searches to be made through captured data, with automatic location and decoding message headers. This search can be by message at a time while viewing data, or the Interview can display a protocol trace of only the control information in an easy-to-read tabular format.

This facility enables the user to investigate the data being transmitted on the communication circuit without the necessity to analyse all the data.

Interleuk Electronics (CW), Reads House, Portman Road, Reading RG3 1LU. Telephone: (0734) 589551.

Image processor extended

THE I'S Model 75 image processor has capabilities of the existing Model 70 applications but with hardware and software features that offer better performance in these areas and allow applications to be extended into robotic vision and industrial automation.

The Model 75 can be hosted on a wide range of computers including DEC, HP and DG Nova/B-clipse. Connection is by interface installed in the host system and I'S System 575 software is available to run under the appropriate operating system. Alternatively, the Model 75 can be used as a standalone utilising the optional built-in LSI 11/23 microcomputer.

The Model 75 processor has been designed to give the user real time multi-spectral or multi-temporal analysis capability in a compact package offering ease of integration into consoles and workstations.

The 64K dynamic RAMs used for refresh memory significantly reduce the number of printed circuit boards required. Only eight boards are needed to store 16 512 x 512 x 8-bit images. In addition, image analysis functions have been significantly simplified and improved. Independent scroll and zoom on each board operate in each dimension and expanded wrap-around capabilities on each board facilitate split screen and roam over image areas as large as 2048x2048.

The front end of the image processor has been redesigned. Spatial transformations are simplified and speeded up and memory requirements are reduced as against conventional systems through the use of Parametric Memory Addressing. This permits functions such as data reorganisation, sub-sampling, random addressing, window mode transfer and vector generation to be performed much more rapidly. A special repeated feature allows graphic outlines to be generated simply saving a considerable overhead on communication with the host.

The RGB look-up tables (separate for each image memory) are 10 bit in, 12 bit out and each table contains four separate transforms which are selected by region of interest marks. Any two of the pipelines can be fed back simultaneously; any two can be combined in the ALU during interactive or recursive processing.

Flex Systems (CW), John Scott House, Market Street, Bracknell, Berks. Tel: (0344) 52929.



Poppy, the 16-bit personal system from Durango.

Poppy is aimed at business users

DURANGO Systems, has introduced to the UK a line of 16-bit personal business systems. Named Poppy, the new offerings are designed to meet business user requirements for one to 12 workstations in a multi-user, multi-tasking environment.

Existing Durango users will be able to upgrade their integrated desk-top systems to the 16-bit microprocessor technology through a field upgrade package, which includes a board replacement.

The Poppy line is aimed at the small business and professional applications areas, where personal computers are not adequate for the needs of a growing business.

No software expertise is expected from the users, and Durango intends to provide the support necessary to implement applications.

The modular design of Poppy allows flexibility in the choice and use of peripherals and add-ons, while also adapting to operator preferences in how the system is configured.

The choice of operating systems includes MS-DOS, CP/M86, MP/M-86, and Xenix.

Durango's own business-oriented language, Star Basic, will operate under either Xenix or MS-DOS.

Poppy customers will have immediate access to generic and application software developed by Durango, as well as software developed for the majority of current personal computers.

A basic Poppy consisting of a 16-bit microprocessor with 128 Kbytes of RAM memory, two 800 Kbyte 5 1/4 in floppy disk drives (96 tracks per inch, IBM compatible), 14 in CRT screen, detachable slimline keyboard, and the MS-DOS operating system, is priced in the US at \$4,395.

The addition to the basic system of 10 Mbytes of hard disc brings the total to \$5,995.

Durango Systems (CW), 3003 First Street, San Jose, CA 95134. Telephone: (408) 946-5000.

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GREY IMPORTS

Microcomputerland was wound up with £200,000 debts after jumping the IBM Personal gun... Steve Harris reports



MUDIE... "The trouble was the issued share capital was only £2".

Why police are probing firm that beat the PC deadline

ONE year ago, Scotland Yard raided the premises of Microcomputerland, a self-appointed distributor of the IBM Personal Computer. At the time, the IBM PC was not officially available in any country outside the US, despite widespread demand for it.

The result was a proliferation of "grey imports" of the machine offered by companies like Microcomputerland.

Such companies did not get their supplies directly from IBM, but through a chain of middlemen and, in most cases, machines were bought over the retail counter in the US to be resold here at a much higher price after transportation, import duties and profit margins had been taken into account.

Such deals were often financed by factoring companies, some of

which turned out to be unwitting partners in questionable transactions.

One such company, Distributed Systems Limited, DSL, called in Scotland Yard when the troubled software house Microcomputerland failed to repay a large sum which it allegedly borrowed from DSL as part of a factoring deal.

In July of last year Microcomputerland was voluntarily wound up leaving debts of £200,000. The company is still being investigated by Scotland Yard and a report is currently with the Director of Public Prosecutions.

DSL, a London contract computer company, has refused to comment on the affair and its director, Michael O'Shea, has instructed his employees to stay tight-lipped.

But former Microcomputerland employee Norman Park, a director at Microcomputersource until it went into receivership recently, says DSL loaned "a large sum of money" to Microcomputerland.

"DSL loaned us the money on the understanding that two weeks later it would be paid back," said Park. He refused to say how much was owed to DSL by Microcomputerland.

Doug Mudie, Microcomputerland ex-sales director, says a number of attempts were made to set up a full scale factoring deal with DSL. But when DSL realised that its loan would not be repaid on time it started an action in the civil court.

Before the case could be heard, however, Microcomputerland had called in the receiver.

In the meantime, DSL had reported the matter to Richmond CID, where Microcomputerland was based. The CID referred the complaint to Scotland Yard and in May of last year the company was raided. Members of staff were questioned and shortly afterwards a number of salesmen were fired by MD Mick Punter.

In July of last year Microcomputerland appointed Bill Roberts of accountants Ernst and Whinney to wind up the company. Although Roberts would not comment on the details of the winding up, he confirmed that Microcomputerland owed creditors about £200,000 and that DSL claimed to be a creditor.

Another company awaiting the outcome of Scotland Yard's investigations is shipping agent Airspeed. It transported IBM machines from the US on a cash-on-delivery basis for Microcomputerland.

"Microcomputerland went out of business owing us an awful lot of money," said Airspeed director John Weller. "The arrangement we had with them was cash on delivery payment, so the goods were not released by us until they were paid for."

Airspeed has since sold off IBM Personal Computers belonging to Microcomputerland to companies including Doug Mudie's Microland and Norman Park's

Microcomputersource on May 17, 1982 - the same day that Microcomputerland's managing director, Mick Punter, resigned as a director and chairman of Microcomputersource - positions he had taken up two-and-a-half months before the voluntary winding up of Microcomputerland.

Microcomputersource had called in the receiver recently with the directors blaming him in the granting of US export licences for the transportation of IBM Personal Computers from the US to Britain as one of the reasons for the company's downfall. Customer orders were held up in the US and even Microcomputersource lost orders worth £12,000 through late deliveries and another £12,000 because of the need to obtain temporary import licences to sell its IBM machines.

Microcomputerland was the first UK company to announce it had circumvented IBM restrictions on exports of the Personal Computer from the US. It bought the machines from Computerland shops in America through a buying agent, says Mudie.

"IBM was quoting six months delivery to US customers but we could get them straight away from Computerland shops," Mudie explained. "When it was at Microcomputerland we bought it



PUNTER... Fired a number of salesmen.

Microcomputersource. "I bought two machines from Airspeed," said Park. "They (Airspeed) finished up with machines which Microcomputerland couldn't pay for and we bought them up."

"That is where Mudie bought his machines from. He was buying them from Airspeed at a ridiculously high price. They could have been bought in the US much cheaper."

"I had a shipment coming over from the US which had not yet arrived and I did not want to let my customer down so I bought machines from Airspeed," said Park.

Mudie claims that Microcomputerland sold off assets, including IBM Personal Computers, to Park's Microcomputersource. "Microcomputersource bought an awful lot of stock from Microcomputerland," said Mudie. "Microcomputerland folded with debts of about £200,000. It is difficult to see how that amount of money can be lost by a company with a staff of 22," he added.

Park denies buying machines from Microcomputerland and claims that his company did not exist when Microcomputerland was wound up. Records at Companies House, however, show that Microcomputerland was wound up on July 5, 1982, and that Microcomputersource was incorporated on April 16, 1982 - two-and-a-half months earlier.

machines a week; over a five-month period we received some 200 machines. We were buying them for £1,500 and selling them for £2,900. With that kind of profit margin it's virtually impossible to lose £200,000."

"The only reason Microcomputerland was in trouble was that it issued share capital was only £2. It should have been about £100,000 but Punter did not up the money," said Mudie.

Microcomputerland had discussions with the Industrial and Commercial Finance Corporation about receiving a capital injection, but no offer was made by ICFI.

"We made a proposal to the Industrial and Commercial Finance Corporation but Punter did not come up with the £11,000 required," said Mudie. "We also had a package deal involving investment from Banque Occidentale among others. The total package was worth £500,000 but it all fell through."

Microcomputerland was set up by Mudie and Punter in December 1981. Punter had been managing director of the Zeus Hermes Investments software house and was involved in selling off the subsidiaries of that group to the Enterprise Systems Group based in Thames Ditton, Surrey. Mudie and Punter sold out when Mudie was fired. "Punter was not happy with my sales performance," said Mudie, "but there was no delay in my handling of the

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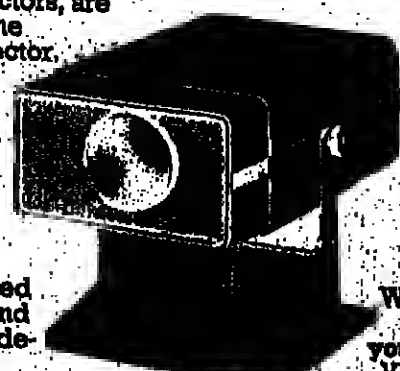
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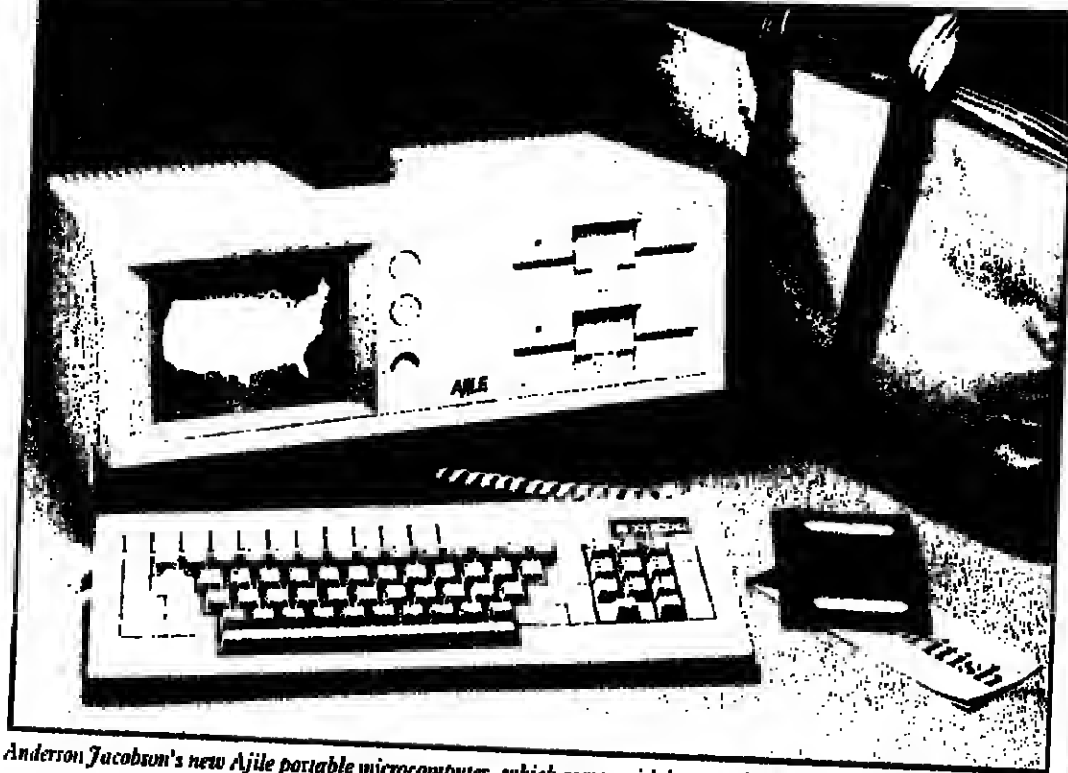
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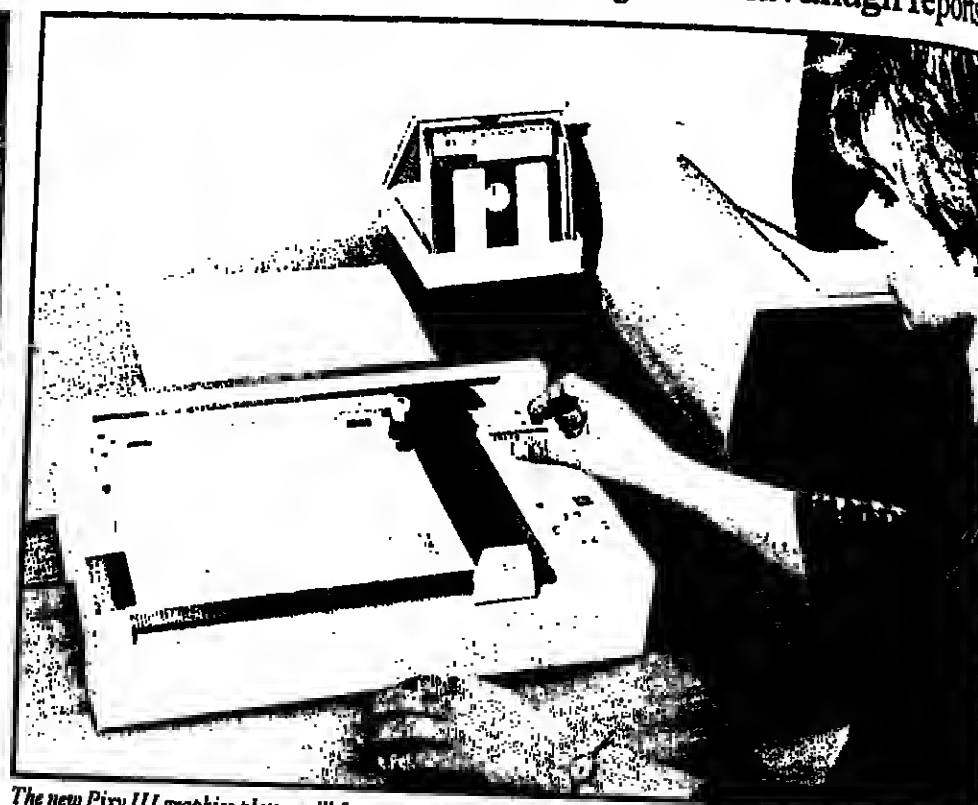
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COMPEC NORTH PREVIEW

Product launches and first public appearances will be a feature of next week's exhibition . . . John Kavanagh reports



Anderson Jacobson's new Ajile portable microcomputer, which comes with its own zip-up bag, will be on show.



The new Pixy III graphics plotter will feature on the Mannesmann Tally stand.

The show goes out to the people . . .

Compec North is at Belle Vue, Manchester, from June 21 to 23. It is open from 10am to 6pm on Tuesday and Wednesday and from 10am to 4.30pm on the Thursday.



The System 32, which Fortuna Systems will feature, runs a super set of a popular word processing system. It offers the standard text editing facilities, with Mail, Record Management and linkage to graphics and Unix utilities.

COMPEC NORTH was the first regional spin-off from the UK's biggest professional computing exhibition. And in this third year of Compec North it is clear exhibitors feel that the idea of taking the show to the people is working.

There is the usual mix of local firms and national companies with local offices. But this year sees some significant newcomers, many of them regulars at the national Compec in London in November but only now joining a regional show.

"Big London shows like Compec attract people from all over the UK and beyond," said Compec manager Tony Kynaston. "But many business people don't feel they can afford the time and cost of two or three days in London for an exhibition. So instead of them coming to the show, we take the show to them."

Leading national firms recognise the benefits of the regional Compecs, too. Companies like Digital Equipment never miss the main Compec - but this year DEC has also come to Compec Scotland and Compec North.

The importance of the regional shows is also shown by the number of product launches and first public appearances of products at Compec North.

One total newcomer to Compec, NCR, could also turn out to be one of the stars of the show. The company's Manchester branch is making the first big public showing of the new 9300, said to be the world's first full 32-bit very large scale integration mainframe for business applications.

The 9300 uses NCR's own 32-bit chips, launched last autumn. As a VLSI computer it is just 7.5 inches high and 17.5 inches wide, so it can sit on a desk or hang on the wall and needs no special air conditioning.

The 9300 is compatible with NCR's 1 range of computers. It is seen as a system for businesses and as a distributed processor - and its compatibility with IBM's SNA network architecture makes it interesting to a big section of the computing community.

At the other end of the scale Anderson Jacobson's new Business Computer Division is giving the first public demonstration of its IBM-compatible Ajile microcomputer.

The Ajile is a portable business system - it comes with its own zip-up bag - with a seven-inch screen and two floppy discs with 320 Kbytes of storage each. It is based on the Intel 8088 processor and has 256K of memory.

Anderson Jacobson claims it is the most powerful portable business microcomputer in the UK. Four software packages covering

text processing, financial modelling, Basic and communications are included in the price of £3,595.

Corporate Modelling Consultants is using the show to announce the opening of its northern office in York. The company specialises in financial modelling systems, notably the Plan package an eight-bit and 16-bit microcomputers and DBC microcomputers and mainframes. Plan is offered on a 30-day money-back trial basis.

The company can supply turnkey systems including Plan on a Sirius computer, plus training, updates and support at £3,345.

Micropute, with an office in Macclesfield, will launch a multi-user business package based on new software and the Shelton Sigm microcomputer. The company is a distributor for the UK-built multi-user machine, and for daisy-wheel and matrix printers from the Japanese manufacturers Ricoh and Oki.

A 10-megabyte Winchester disc version of the Z100 microcomputer will be shown for the first time by Zenith Data Systems. The Z100 has both an eight-bit and a 16-bit processor, up to 960K of user memory, two 320K floppy disc drives and four circuit board slots for expansion.

A programmable robot, Zenith's Hero, will no doubt be an attraction. Hero is designed for the education market. It can sense light, sound, motion and obstacles in its path and can pick up small objects. It can be programmed, to speak through a synthesiser.

Tektronix will give the first public display of its 4105 colour graphics terminal. As a low-cost product selling at just under £3,000 it is aimed at just under £3,000. It has a drawing speed of over a million picture elements a second and a resolution of 1,024 elements by 1,024. It has a palette

of 16.7 million colours and can display 256 of them at a time. Options include input through graphics tablets.

Compec North will also see Data Type's northern launch of eight-bit and 16-bit microcomputers

from Televideo.

Two exhibition firsts come from data communications specialist Master Systems, a regular at the main Compec and all the regional shows. The company is showing for the first time in the North of England a new lower-cost version of its Masternet integrated office system.

Master Systems' new Micronode, launched last month, provides electronic filing, electronic mail, computing as a microcomputer or as a terminal to a larger machine, word processing and links to the telex and Prestel videodata services. The system, based on the Xibus, acts as a workstation cluster controller with its own data storage. As such it can work on its own or as part of a wider network.

Master Systems says that at a starting price of £4,000 the Micronode can provide the basis for a pilot office automation scheme in a big company or form the heart of a complete system in a smaller firm.

Master Systems' other new product is the Lineraster, which combines voice and data traffic on the same line, thus removing the need for cabling whenever an extra device is installed.

Timeplex is another Compec regular and it, too, has saved new products for Compec North. Its Wideband Microplexer is for wideband digital links such as British Telecom's KiloStream service. It can handle speeds of 460.8 kilobits a second.

Access to BT's Packet Switched service is provided by the new Timeplex Microplexer X25 packet assembler and disassembler. And the Ampac Bandwidth multiplexers synchronise data by allocating bandwidth to active channels only.

New printers include the Lasergraf 1200 page printer, launched last month by Fragma. This laser beam printer runs at 12 pages a minute and provides characters of variable width and figures, while the microcomputer and microcomputers, supplies and software, from local and national companies.

COMPEC NORTH PREVIEW

Move North—and halt the exodus of skills from dying factories

David Casey looks at some of the efforts to counter mounting unemployment

TO the desk-bound Londoner, the North starts at Watford. Beyond the borders of Bedfordshire, the Midlands tower the shipyard cranes, the blastfurnace chimneys and the Gothic architecture of heavy manufacturing.

At least, that was the case until orders for merchant shipping declined and the flow of steel was stemmed.

Seen from the other side of the "border" - up in Manchester or Hartlepool - the mounting unemployment has a grim reality. The problem facing the former industrial capitals of the North has been recognised by successive governments, however. Under Whitehall's regional assistance policy, development areas were designated where conditions appeared most acute.

Many of these "intensive care units" have long since been upgraded to special development areas, offering 22% capital grants and comparable incentives for job creation.

During the 1960s and 70s, these measures seemed to be counteracting the structural decline in the region's economy, and justified the expensive development area programme. This support has continued virtually unaffected by the redrawing of regional aid boundaries in 1979.

In the past five years it has been the turn of the factories to close. Mechanical engineering firms were casualties first, the malaise spreading insidiously to the heavy electrical sector.

The immediate job loss is critical: there is little prospect for a man of 50 to find stable employment.

Even more severe is the effect that the recession has had on the skills within the area. Men with a lifetime technical experience are leaving the North, attracted by brighter prospects of a future in the Midlands and South-east.

Not all have benefited by the move: steelworkers settling in Corby were to experience their second upheaval in a decade when the BSC withdrew.

Stemming this outward flow of skills is now the prime objective of any economic strategy for the North. This will only be achieved if successful companies can be persuaded to relocate there.

At first sight, the expertise of a redundant shipyard worker might seem of little relevance to the high technology manufacturer. But an

industry embracing as shipbuilding employed a spectrum of professions, including electronics and control engineers, and a full complement of mechanical designers.

Equally important for the regeneration of industry in the region the decline of the yards released a wealth of management experience.

The North-east was a natural choice for a clutch of enterprise zones when the concept was outlined in Sir Geoffrey Howe's 1980 Budget. The benefits available in an enterprise zone are primarily ten years' freedom from rates, and minimal planning requirements. They are independent of any other incentives which apply in the area.

A 270-acre zone in Hartlepool, for example, is within a special development area. The total package of aid would therefore include the maximum grants of 100% capital allowances. As an inducement to create employment, grants of up to £8,000 per job are available for projects in office and service industries.

Management considering expansion in a UK assisted area are faced with an overwhelming array of incentives. There are steel closure schemes in South Wales, Corby and parts of the North-east, for example, with special concessions on offer in Ulster.

The packages may differ from area to area, but the net effect is broadly the same. Companies planning a move to an assisted area could be forgiven if they stuck a pin in the map.

Opto-electronics manufacturer Isocom took a more rational view when it opted for the Hartlepool enterprise zone as the site for a new factory. The company's technical director, Andrew Mann, has moved from the US to start operations.

He justified what might at first seem an unlikely choice. "There was a well-trained workforce on our doorstep - 1,200 had just been made redundant by GEC. Once we have the people we want, they can be trained without the worry that we might lose them. In our type of business, the aim is for long-term continuity for five to ten years."

Mann compared the situation in Hartlepool with his previous experience in California. "With the shortage of manpower ever there, we would stand the risk of a com-



Gone are these dark satanic mills . . . and the jobs too.

petitor hiring our staff for a few cents more after we had invested heavily in their training. Here in the North-east, there is a degree of protection - there is nobody else around to take them."

Isocom's new premises are being built to their specification and will be made available on an initial eight-year lease.

It was during the negotiations that Mann appreciated the problems which could be faced by high technology companies. "It takes a while to educate both sides in the deal: we took it for granted that they would understand our requirements. The authorities are more used to dealing with heavy industry."

It took Isocom a year to find the right location for the factory, which will employ up to 100 people when it opens early in 1984.

Were Mann and his board influenced by the enterprise zone status of Hartlepool? "That was a key factor. As a start-up company, we were looking for ways of getting help. The rent is low, and there are no rates in the early years."

If communications within the UK had been the critical factor, an enterprise zone in Greater Manchester or Merseyside might have been more attractive to Isocom. A location at the crossroads of Britain's North-South and East-West routes is perhaps Salford's greatest asset as an enterprise zone. Perched incongruously on the edge of Manchester, the city once had an economy based on shipping and the import of raw materials for processing.

The site that was left when rows of "Coronation Street" terraces were cleared appealed to one firm with extensive experience in assisted areas: Terminal manufacturer Data Type has set up a sales and service branch in Salford within the past two months. Three years ago, the company opened a factory in Cwmbran, one of the South Wales development areas. It was there that the company began its original accommodation, and has now taken up larger premises on another site provided by the development authority.

Alpo Richardson, the UK sales manager, explained the reason for the new development at Salford. "We wanted a sales office to complement Cwmbran and the London branch in Wembley. The site we chose is a stone's throw away from a first class network of motorways, making it ideal for the staff there to serve the whole of the North region."

Apart from administrative delays in completing the agreement, setting up less than two months ago posed no major problems. Despite high levels of unemployment, however, there were few

staff available with wholly relevant sales or technical experience.

Data Type has now recruited the people it needs, but companies in a similar area of technology would be advised to check skills availability with particular care before entering negotiations for regional support.

Financial assistance is the major stimulus for many manufacturers prepared to invest in the North. But there are other benefits. Under the Contract Preference Scheme, firms to the assisted areas are given every opportunity to tender for public sector contracts.

The hostile attitude faced by the county's microprocessor development officer when first appointed three years ago is only now beginning to soften; the influence, perhaps of IT Year

Where all other considerations are equal, government departments, nationalised industries and other public bodies will opt for one of these companies.

Despite this impressive portfolio of incentives, Merseyside County Council has an uphill struggle to attract companies to its area. Centred on the old city of Liverpool, the county taken in the equally depressed townships of Birkenhead, Kirby and Speke.

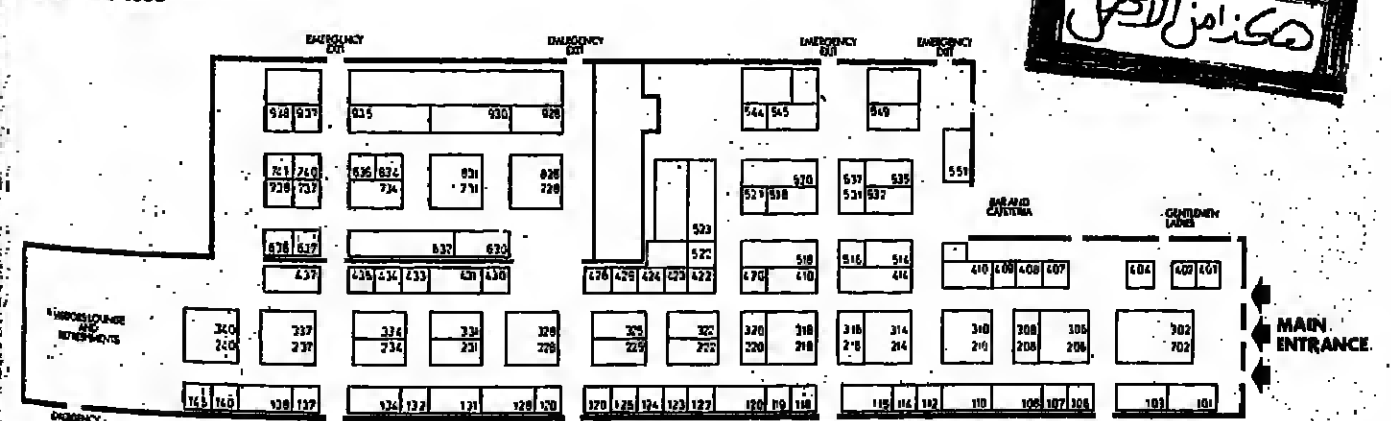
Trying for the past three years to wave the flag for advanced technology on Merseyside has been Dr Russ Aubusson, the county's microprocessor development officer. His role is to stimulate interest in micro systems - as much to stem the steady decline in local industry as to generate new enterprises. The hostile attitude that he faced when first appointed three years ago is only now beginning to soften; the influence, perhaps, of IT Year.

An essential part of Aubusson's task is to help high technology projects through the critical phase from development into production. His work brings him into close contact with the academic community.

From his unique standpoint, Aubusson is promoting Merseyside as a technological resource. "We are concentrating on setting the right requirements for success in high technology ventures, and trying to integrate the industrial and academic sectors."

COMPEC NORTH '83

BELLE VUE MANCHESTER
JUNE 21-23 1983



Your guide to next week's show

Alphanumeric Keyboards	407	Fife Regional Council	231/232	Midwest	206/306
Alpex	123	Fortune Systems	114	Modata Computer	835
Anderson Jacobson	222/223	GBC Computers	431/432	Nabu Commercial Terminals	220/320
Benson Electronics	145	General Datacomm	322/323	NCR	134/135
Blissgate Terminals	103/104	Graham Wright Computers	928/929	Newbury Data Recording	73/831
British Olivetti	408	Gulfstream Bytec	523/524/525	Perkin Elmer Data Systems	549/550
Brown's Operating Systems Services	935	Ideal Telephone Company	335/336	Philips Business Systems	325/326
Byte Shop	401	Instrumentation Laboratories	423	Prisma	531/537
CACI	738	Intac Data Systems	528/529	Project Office Furniture	110/111
CASB	334/335	Integrated Micro Products	106	Raven Computers	930/931/932/934
CEM	214/314	Interlekt Electronics	414/415/416	Regal Data Supplies	122
Chief Systems	426	IBM Computers	514/515	Search Computers	331/332
Computer Weekly	532/533	JB Computer Systems	118	Southdata Software	741
Corporate Modelling Consultants	202/302	Kendata Peripherals	630/631	Tammy	404
Davoll Engineering Services	516	Kode	124/125	T-Bar International	539/541
Data Disk	527	Longs	120	Technology for Business	734/735
Data Type Terminals	118/419	Lynwood Scientific Developments	108/109	Tektronix	539/541
Department of Industry	545/546	Mannesmann Tally	108/109	Terminal System Services	420
Design Data Systems	430	Mannesmann Tally Direct	551/552	Ticon Computer Company	107
Digital Equipment	228/328	Manpower Services Commission	131/132	Timeplex	728/828
Dynalco Systems	129/130	Master Systems	218/318	Transac Computers	138/139
Electronic Services	216/316	MBS Microtext	632/635	Trend Communications	225/226
Electronic Information Systems	237/337	MGP Microsystems	435	Tulse Data	424
Encl Data Products	234/235	Micro Buter	208/308	Umbra Software	522
Encl Computer Systems	210/310	Micro Design	128	Unit C	437
		Micro House	101/102	Willis Computer Supplies	410/411
		Microput	240/340	Zenith Data Systems	518/520
		Micro Technology Journal	544	Zygal Dynamics	437/438

Mervyn Pragnell looks at natural language processing

A whole new approach to computer logic

MANY attempts have been, and are being made, to incorporate some natural language facilities into computing systems. This attempt is one of the facets of the Japanese programme to develop the so-called fifth generation machine.

However, if the fifth generation machine is ever to become viable it is quite useless to persist with classical logic as an integral part of the system. The necessary logical sophistication for dealing with natural language processing is completely missing from Boolean algebra and its various classical extensions.

Jon Barwise and John Perry of Stanford University have created a completely new approach to many problems of natural language semantics and inferences.

A book, soon to be published by Massachusetts Institute of Technology (next month in the UK) called *Situations and Attitudes* (approx. £13) will present a great many of the technical details and will obviously give a more detailed story than I can here. The title of the book should not mislead you into thinking the contents are of no consequence to the computer world.

We can state at once that traditional Boolean algebra, much beloved by computer engineers and some programmers, receives a

They see at the root of many problems the tendency of mathematicians to overlook the extremely efficient nature of ordinary language

severe mauling. Hardly any of it remains. It is replaced by something much better.

How could this possibly be? Let's begin by looking closely at two concepts of denial. We have first the ordinary Boolean denial. This is quite often denoted by placing a bar over a letter, or literal, to denote the denial of the value that has been given. We know that this operation gives the value 1 if the literal has the value 0 and vice-versa.

For example, we are in a situation, say, where we are aware that our cat is purring. We can abbreviate "Our cat is purring" by A. This states that our cat is not purring.

Suppose, however, that there is no cat. In this case, it does not make much sense to assign a truth value of either 0 or 1 to the statement "Our cat is purring," since we have moved out of bounds of the original situation.

It is possible to make the all-inclusive statement "It is false that our cat is purring."

"Our cat is not purring" does not follow automatically from this statement, since there may not be a cat.

We can say that "Our cat is not purring" belongs to a sub-collection of the set of situations described by "It is false that our cat is purring."

This brings us to the notion of entailment. We can say that a statement S1 strongly entails a statement S2 if all situations that support the truth of S1 also support S2. In our example, we might well find that all situations that support "Our cat is not purring" will also support the larger statement "It is false that our cat is purring."

Barwise and Perry develop this notion of entailment for situations which are not clear cut, but where different strands of evidence need to be considered.

Quite clearly many Boolean laws, depending as they do on situations being either true or false, will vanish.

Barwise and Perry also discuss a new way for computers to analyse sentences. Their approach is to take the meaning of a sentence in isolation, and then assign a numerical value to the meaning according to related knowledge contained, perhaps, in a computer database.

To use an example from Barwise and Perry, I can say "My dog is this colour" pointing to a brown tile on the floor, and you can say "My dog is this colour," pointing to a grey tile. Both sentences are identical, so they must have the same meaning in isolation, but they have different interpretations. The dogs referred to are different.

Barwise and Perry would use acquired knowledge of the colour of the tiles pointed to, and give values to the two sentences accordingly. The first might have the value 1, and the other 2.

By contrast we can have two sentences with exactly the same interpretation, but a different meaning. For example I might say "I am sitting" and then stand up. My friend could then say "You were sitting." Both sentences have the same final interpretation, but a different meaning in isolation.

An important distinction is also made in the book between the information carried directly by the meaning of an utterance, and the information carried (loosely speaking) by the context.

For computer people the message is clear: Barwise and Perry believe that much of modern logic may be entirely appropriate for the analysis of the foundations of mathematics, but is relatively useless when used to formalise or clarify inference stated in ordinary language.

They see at the root of many problems the tendency of mathematicians to overlook the extremely efficient nature of ordinary language. We alluded above to the ability of ordinary language to recycle the same sentences with different interpretations. This is quite unlike what is usually encountered in mathematics. The formulae of mathematics are used over and over again with the same interpretations.

In addition to the efficiency of ordinary languages we have the relativity of ordinary language. Different expressions with different meanings can be used in different circumstances with a single interpretation.

Robotics can also expect to benefit because of the work Barwise and Perry have done on the logic of perceptual reports. Consider, for example, the distinction between:

1. I saw John leave his car at the police station; and
2. I saw that John left his car at the police station.

With regard to the first sentence you could add a rider, such as, but thought it was Joe." It is clearly impossible to do this with 2. It may well be that instrumental-

tion of complicated situations would benefit by the exploitation of situation semantics. After all, instruments are meant to provide information about situations. Instrumentation backed up by powerful inferential procedures might save many a 3-mile island situation from developing.

I believe I have written enough for computer people to see that a

completely different approach to logic now exists. I will end this article with a quotation from *Situations and Attitudes*.

"We had become convinced that the standard view of logic derived from Frege, Bertrand Russell, Tarski and work in mathematical logic is completely inappropriate for many of the uses to which it has

been put by philosophers, logicians, computer scientists and others — full of ideas appropriate to the mathematics (even there we have doubts) but are inappropriate to more ordinary uses of language." Challenge for Knowledge Processing Systems. T. Barwise, Proceedings of the International Conference on Fifth Generation Computer Science, Information Processing Systems Centre, October 1981.



"Our cat is purring" — but only if there is a cat.

WOULDN'T YOU LIKE TO ENJOY 6 PROGRAMMES WITHOUT CHANGING CHANNELS?

You're looking at some of the most used business programs being used together.

They're being worked with just as a businessman would work with papers at his desk: taking facts from one, a chart from another, figures from a third.

The difference is they're not on a desk, they're on a computer.

A computer which doesn't require you to change programs, because the 6 key business programs are already built into the machine, uniquely integrated. Ready for you to "cut and paste" from each other as and when you need to.

And once a businessman learns how to work with a program, the others follow almost automatically.

IF YOU CAN WORK AT A DESK YOU CAN WORK WITH A LISA.

Lisa is not only easy to work with, it's incredibly easy to learn. You don't need the key-board to operate it. Lisa is a small-sized, desk top computer. By moving it, the points to the tool on screen he wants to use.

Suddenly, the screen is filled with the information he needs. And Lisa's functions are as simple as pointing at icons on the screen — we call them desk "icons" — and he understands.

For instance, the symbol for stationery looks like a sheet of paper; files look like files, a clipboard looks like a clipboard. There's even a calculator and waste paper basket on screen. Like all functions, they're ready for use at the touch of the "mouse".

This is the fundamental difference between Lisa and any other personal computer; it doesn't require you to understand how it works, because it understands how they work.

Thus allows someone who knows nothing about computers to get to work with one, fast. PERSONAL COMPUTER HAS EVER BEEN THIS POWERFUL.

People who want to run tailored programs, spreadsheets, BASIC, PASCAL and COBOL high level languages. Lisa includes a 1 megabyte microprocessor.

For more information and/or a demonstration of Lisa in action, fill in this coupon.

A personal attachment from Telex

COMPUTER Peripherals (Systems) has announced a new personal computer attachment from Telex, the Profit — Professional Office Terminal.

This attached processor attaches to a Telex 278 display terminal and is designed to integrate existing Telex 3270 interactive systems with personal computer applications. Thus Telex users can now store and retrieve interactively information from a remote host computer system and process local applications concurrently.

Chris Delve, sales and marketing director of CPS, explains: "A single keystroke allows the operator to switch back and forth from online 3270 processing to local functions. This dual personality feature for host and local functions allows users the most convenient method to change screen updates without time consuming and involved log on and off

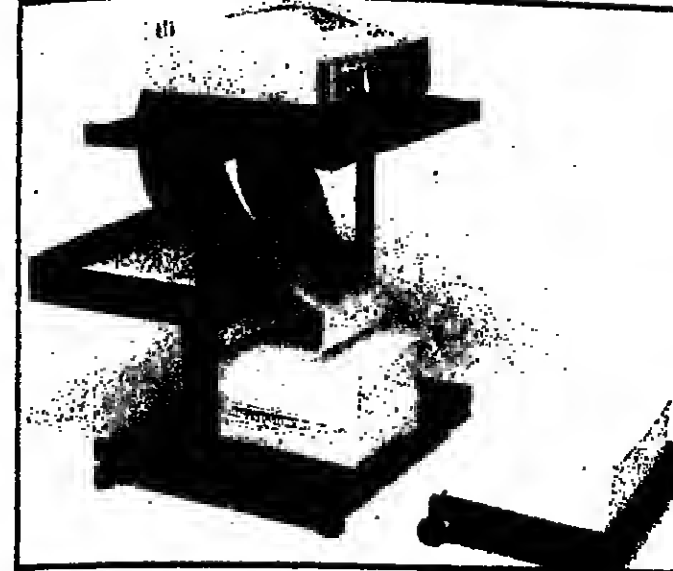
procedures of other systems."

Features of the Profit include an Intel 8088 16-bit microprocessor; 128K of main memory optionally expandable to 640K; two 5¼-inch single-sided double density diskette drives with a total of 320K storage; and a choice of matrix and daisywheel printers.

A double-sided double density diskette and a 10 Mbyte fixed Winchester type disc is planned.

Word processing and spreadsheet calculation software packages Select and Supercal are provided and supported by Telex. In addition an exclusive option the TX/SPF Editor is to be available for offloading the development of Cobol programs from remote host systems to the local attached processor system.

Chris Delve, Computer Peripherals (CW), 349 City Road, London EC1. Tel: 01-278 7837.



The Gallid printer stand and caddy.

Stylish printer stand

THE Gallid printer stand has been designed to suit a wide range of dot matrix and word processing printers. It has a black ash wood grain finish which gives the stand a stylish look. Other wood grain finishes can be supplied upon request.

A reversible paper feed slot accommodates a wide range of bottom feed printers, says Gallid.

The printer stand has heavy duty castors. For use with or without the printer stand is the Gallid printer caddy which has been designed to make light work of moving heavy listing paper.

Gallid (CW), 1 Bliton Road, Rugby, Warwickshire CV22 7AA. Tel: (0788) 74442/3.

main memory and 17 megabytes of built-in mass storage on two floppy disks.

A 5 Megabyte Profile hard disk storage allows all Lisa applications to be stored on one disk.

A high resolution bit-mapped screen makes Lisa graphics very special.

Lisa's dot matrix printer (160 x 144 dots per inch) features proportional spacing with bold, italics, or underlined characters. And Lisa lets you print in any one of 11 different type styles.

You lay out what you want to print on the screen and the same high level graphics you get on the screen you get on the printer.

—NOW THERE'S AN APPLE FOR EVERYBODY—

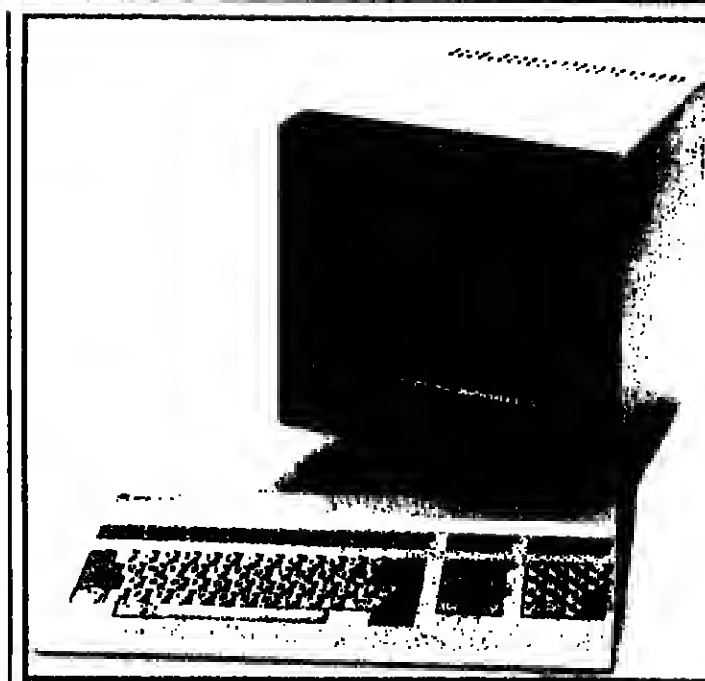
Apple invented the personal computer. Now the Apple Lisa, along with the new Apple IIe and Apple III, puts the power of personal computing at the fingertips of everyone from the managing director of a big business to the owner or manager of a small one.

Everybody should have a friend like Apple.



For more information and/or a demonstration of Lisa in action, fill in this coupon.

Name _____
Company/Address _____
Tel no _____
Apple Computer (UK) Ltd., Eastman Way, Hemel Hempstead, Herts HP2 4BR. FREEPOST.



The Eurobee is designed for Europe.

Beehive is a honey

A DISPLAY terminal designed for the European market has been launched by Beehive International.

The Eurobee FT-10 uses an Intel 8085 processor and has 6K of user memory, which can be expanded to 40K. The 14-inch screen has 24 80-column lines plus a status line. It can display light characters on a dark background or vice versa. Double-height and double-width characters can be displayed.

The terminal has 107 keys, including a numeric pad and eight function keys, which can transmit

16 codes using the shift key. All European character sets, plus 161 graphics symbols and 16 bar codes, are included.

Features include editing functions, transmission rates ranging from 50 to 19,200 bits a second, an auxiliary port, an RS422 interface and synchronous communications. Emulators for Televideo, Data General, MAI, Datapoint and other terminals are available.

The price of the display terminal is £1,085.

Beehive International (CW), Index House, Ascot, Berkshire SL5 7EU. Tel: (0990) 23377.

Laser range introduced to the UK

DIGITAL Technology has introduced a range of laser printers to the UK. They combine precision scanning optics, a semiconductor laser and electrographic copier technology with a video generator and computer interfaces. The result is a quiet printer designed to print text, graphics and bit-map images from a host computer via industry-standard parallel or serial interfaces.

Two models comprise the basic range. The LBP11/M2 is described as offering electric typewriter quality at over 900 lines per minute with full forms drawing and shading capabilities. The LBP11/G1 is the M2 with a powerful graphics interface which will support up to 400 type fonts.

Documents may be printed in either "landscape" or "portrait" modes, selected via a simple command set which the computer user embeds into his software. Multiple copies and different type-font selection are among the other features which may be selected under user control.

Digital Technology (CW), Clark House, Kings Road, Fleet, Hants GU15 9AL. Tel: (02514) 24467.

File handling solution

ONE of APL's weaknesses — file handling — could be overcome by the AFM file management system from Cocking and Drury for IBM APL. The system is said to be completely compatible with APL running under the VS operating system and needs no changes to application programs.

It lets the user develop secure, controllable systems which give many users access to files.

The company points out that the product launch means APL can now be used to program full commercial systems.

AFM was developed by the US software company Interprocess Systems. Cocking and Drury (CW), 16 Berkeley Street, London W1X 5AE. Tel: (01) 493 6172.



The Tektronix 4116A.

Over 15,000 characters on display

DESIGNED to provide extremely high resolution capability for complex graphics applications, Tektronix announces the introduction of the 4116A Display Terminal.

The 4116A features a 635mm (25in) Direct View Cathode Storage Tube (DVST). As a direct result of its 4096x3120 viewable resolution and finely etched 10mil-wide vectors, smooth contour lines are possible in highly complex line drawing applications common to cartography and computer-aided design. In addition to high density graphics displays the 4116A provides density alphanumeric for labelling designs and maps. Over 15,000 characters may be displayed simultaneously.

Host communications are also reduced by the 4116A's high speed transmission rate of 50 to 19,000 bits per second sustained, including independently specifiable receiving and transmitting rates.

Another feature incorporated in the 4116A to enhance speed is the redraw capability. Tektronix (CW), PO Box 69, Harpenden, Herts. AL5 4UP. Tel: (05287) 63141.

The North of England's own computer systems, peripherals and software exhibition...

COMPEC NORTH '83

Belle Vue, Manchester.
June 21-23, 1983.

If your company owns or is thinking of buying a computer, visit COMPEC NORTH '83, the only exhibition in the North of England for serious computer users and DP professionals.

On show will be mini- and micro-computers, small business systems, software, printers, terminals, other peripherals, telecommunications equipment and word processors. This exhibition offers you an unequalled opportunity to meet and discuss with the experts, hardware and software best suited to your company's requirements.

Opening times are: Tuesday June 21, 10am-6pm
Wednesday June 22, 10am-6pm
Thursday June 23, 10am-4.30pm

COMPEC NORTH '83

Belle Vue,
Manchester.
June 21-23,
1983.

COMPLIMENTARY TICKET

Value £2.00

Complete the registration form, and present at the door for FREE admission

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Job Title (tick one)

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Computer-related advertising material may be sent to you as a result of filling in this card. If you do not wish to be included on any other mailing list please tick box: ☐

PRODUCTS



The IBM-PC operating as an intelligent remote terminal to an IBM system running Isco's Tell-a-Graf package.

Package turns IBM-PC into graphics terminal

ISSCO UK announces a software package that enables the IBM Personal Computer to function as a graphics terminal for the design of high quality computer graphics. The software also provides the capability for storing completed graphics on the PC for later viewing.

The new package has two parts: a device driver for a mainframe, mini or 32-bit micro "host" computer on which Isco's Tell-a-Graf or Display graphics software is installed, and a floppy disc "graphics link" for the PC.

In operation, a user enters graphics commands and data through the PC, accesses the host computer software to produce graphics, and previews the results on a low resolution screen. Following preview, the graphics can be reproduced in high quality on

any of more than 135 output devices currently available for Isco software, including slide-making machines, multiple pen plotters and laser printers.

Additionally, graphics can be reproduced as paper copy on an attached IBM impact printer and as overhead transparencies on a low cost digital plotter.

A further capability allows storing of completed graphics on a floppy disc for later recall and viewing, and for creating hard copy if desired.

Because the new software uses low-cost PC hardware, it can significantly reduce the costs of installing graphics capabilities and greatly increase the number of people in an organisation who can take advantage of high quality graphics.

The new product retains all the

machine independence of Isco software, which means the PC can interface to computers from 10 different manufacturers: Apollo, Burroughs, CDC, Cray, DEC, Honeywell, IBM, Perkin-Elmer, Prime and Univac.

To accept the new software, the PC needs to be configured for graphics with a serial communications adaptor, a colour graphics adaptor and a monitor.

The initial price of the host computer device driver is £1,250. Encoded floppy discs cost £160 each.

Isco's recently announced Data Connection package provides a software interface between existing application software and databases and Tell-a-Graf.

Isco UK (CW), 340/2 Kilburn High Road, London NW6 2QT. Tel: 01-328 4462.

Low-cost input claim

LATEST family of digitisers from US specialist Summagraphics is aimed at the OEM market and is claimed to offer low-cost input.

There are two models in the MAI series. The MAI 960 has an active area measuring six inches by nine inches. The MAI 1200's active area is 12 inches square. Both use the same format, so they can be interchanged to handle documents of different sizes.

All the electronics for the MAI range are on a single circuit board. The units have built-in diagnostics. They can provide absolute co-ordinate output in the same way as a true digitiser or delta co-ordinate output such as that provided by a "mouse".

The MAI products provide a resolution of up to 500 lines per inch. They can automatically scale output both horizontally and vertically to match any display resolution.

Summagraphics (CW), 3-4 Winchcombe Road, Newbury, Berkshire RG14 5QV. Tel: (0635) 32257.

Image 'lasts' five years

A RANGE of thermal papers claimed to reduce wear on print heads is available from Dracard. The company is setting up a network of stockists to sell the papers to users of printers, calculators and facsimile machines.

The papers are available in five sensitivities and any width up to 27 inches. Dracard says it is hard to print heads because it leaves a "negligible" amount of residue.

The standard image colours are black or blue but other colours, plus two-colour papers, can be supplied.

Dracard says the paper will keep an image for over five years when stored in darkness under normal conditions.

Dracard (CW), Wallis Avenue, Park Wood, Maidstone, Kent ME15 9NB. Tel: (0622) 64647.

700 hours of memory

A MEMORY module with its own power supply has been introduced by Intem Computer Systems for Digital Equipment LSI-11 computers.

Applications include production control, where production data or control parameters need to be protected from power loss, especially when it is not practical to download from a host computer.

The F074 module provides up to 64K of memory with a battery back-up. It can be installed in any DEC Q-bus systems and offers full 22-bit compatibility. Operating speed is 350 nanoseconds.

Memory retention using the battery is at least 700 hours.

The memory consists of two 32K blocks, each with its own start address. The address can be set on any 8K boundary. Write-protect can be selected for any 8K block.

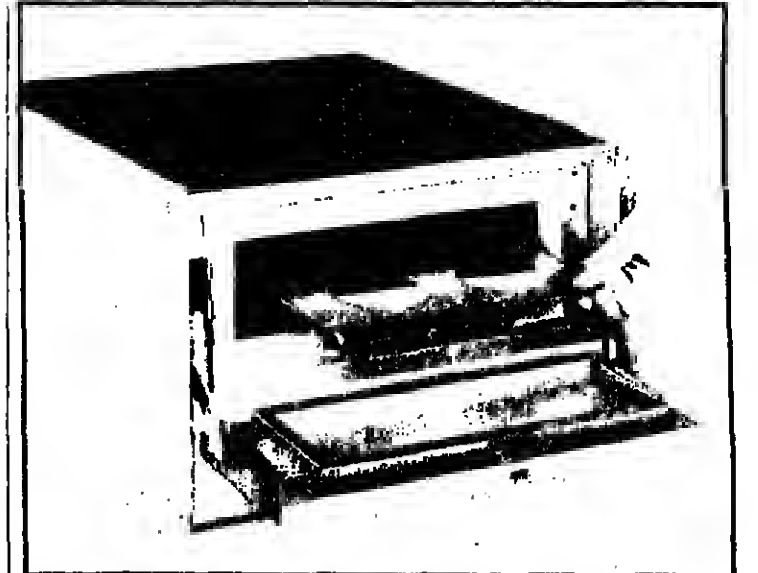
Intem Computer Systems (CW), Watton Industrial Estate, Stone, Staffordshire ST15 0LT. Tel: (0785) 812131.

A printer from Japan

A DRAFT and correspondence matrix printer from the Japanese firm Toshiba is now available in the UK from Thame Systems.

The TH2100H has a 24-pin head. It prints at up to 192 characters a second for drafting and at 100 characters for letter quality. For correspondence quality, the unit prints overlapping dots in a single pass.

Two letter-quality fonts are provided as standard. Over 10 international and graphics characters are available. Proportional spacing



UVP's new PR-100 photoreactor.

Photoreactor solution to clean surfaces

A PHOTOREACTOR, targeted at those concerned with surface cleanliness in a wide range of high-technology industries, is announced by Ultra-Violet Products.

In many scientific and industrial applications a clean surface, free from organic contaminants, is critically important to ensure product reliability and to reduce rejection rates. In the quartz crystal, optics and silicon wafer processing industries, for example, or any other applications where an automatically clean surface is required, UVP claims a highly effective yet simple solution.

Designed to be a final cleaning stage after normal chemical cleaning methods have been used, the PR-100 will produce a surface that is scrupulously free of organic contamination, says UVP. Using a photochemical reaction of ozone and ultra-violet, produced within the chamber of the unit, organic contaminants up to 150 monolayers deep become active then dissociate into harmless volatile gases. The end result is that surfaces can be micro-cleaned within 5-10 minutes.

Ultra-Violet Products (CW), Science Park, Milton Road, Cambridge CB4 4BN. Tel: (0223) 355722.



Shannon Datasort's new diskette binders.

Binders for floppy information

DISKETTE binders for safe, anti-static storage of floppy discs and fast retrieval of information, are announced by Shannon Datasort.

The four-ring binders, in dark blue PVC with an index panel on the spine, are available in a standard version for straightforward storage and retrieval, or an easel binder which folds back to form a stable base for worktop reference to the plastic pockets holding floppy discs.

The binders hold a maximum of 40 5¼in or 20 8in discs and each is supplied complete with a set of double-sided plastic pockets which have individual index cards for each diskette. The anti-static plastic protects the diskettes from dirt and dust and the special "bubble" surface minimises contact with each diskette.

Shannon Datasort's new binders are part of a comprehensive range of diskette storage featured in the recently published mail order catalogue.

The standard diskette binder with 20 5¼in envelopes costs £10.50 and the easel version is £12.50, exclusive of VAT. Spare sets of pockets are available at £6.75 plus VAT.

Shannon Datasort (CW), 36 Croydon Road, Beckenham, Kent BR3 4BH. Tel: 01-650 4818.

Aztech Equipment Sales (CW), Sanderson House, 22 Station Road, Horforth, Leeds LS18 5NT. Tel: (0532) 580058.

Tilting and rotating display

ALPHA Microsystems, the UK subsidiary of Californian microsystems manufacturer Alpha Micro, has announced the addition of the AM-60 video display terminal to its product line.

The AM-60 features a tilting/rotating screen display, detachable keyboard, horizontal/vertical split screen capability, line drawing character set, programmable function keys, and programmable status lines. It can be used with any Alpha Micro system from the seven-user desk-top computer to the 60-user AM-1062 supermicro.

"Our dealers can now enjoy the convenience of a single source of supply and service for both Alpha Micro video display terminals and Alpha Micro computer systems," said David Ford, UK general sales manager.

"In addition," he can now develop software that takes advantage of the many special features of the AM-60 - an extra benefit from including terminals as part of our line of peripherals."

Alpha Micro designs/manufactures and markets microcomputers for business, professional, scientific and educational use. These are distributed through a worldwide network.

Alpha Microsystems (CW), 56 Herchel Street, Slough SL1 1PY, Berkshire. Tel: Slough 821922.

If the power goes down

THE Dataguard uninterruptible power supply from Aztech Equipment Sales removes mains interference and can run a microcomputer for 2.5 hours in a power failure.

The UK-built unit has a sealed, maintenance-free battery, a charger, a converter to change between battery and mains output and a monitor and switch to move from the mains to the Dataguard at the relevant moments.

Aztech Equipment Sales (CW), Sanderson House, 22 Station Road, Horforth, Leeds LS18 5NT. Tel: (0532) 580058.

Intelligent point-of-sale device

VECTOR Data Systems, of Dorset, has launched the VCR-2 intelligent point-of-sale cash register terminal, which can operate in the standalone mode as well as communicate with a computer.

The VCR-2 is intended for use with the Southwest Technical Products range of computers.

Unlike many point-of-sale terminals on the market, the VCR-2 has its own screen. This enables the user to scroll through on screen to answer customers' enquiries on, for example, prices or availability. It also has its own processor.

For storing the data from sales, there is a built-in digital tape unit and for printing out receipts a 20 or 40 column dot matrix printer.

Vector Data Systems (CW), Grosvenor Buildings, High Street, Gillingham, Dorset. Tel: (07478) 3247.

More store on Z100

ZENITH Data Systems has launched Winchester drive version of its Z100 series of microcomputers.

The Winchester systems increase the storage capacity of the Z100 series while enabling users to access information faster, says Zenith.

The new versions of the Z100 have built-in 5¼in Winchester hard drive with a capacity of 11.7 Mbytes formatted.

There are two Winchester models available: the ZW-110-32,



The VCR-2 intelligent point-of-sale terminal.

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A DRAFT and correspondence matrix printer from the Japanese firm Toshiba is now available in the UK from Thame Systems.

The TH2100H has a 24-pin head. It prints at up to 192 characters a second for drafting and at 100 characters for letter quality. For correspondence quality, the unit prints overlapping dots in a single pass.

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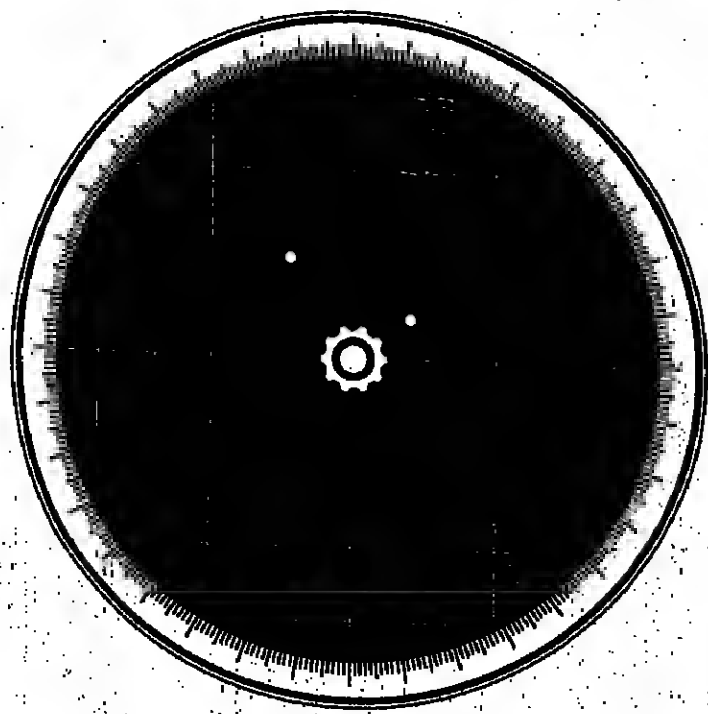
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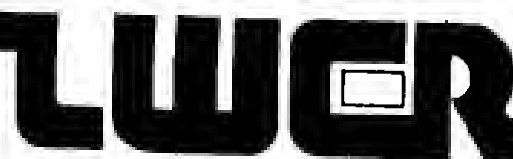
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Midlands £ negotiable

A high technology company requires engineers with at least 5 years research experience for their R and D laboratory for new product research, quality control investigation and technical service support for the group's operations. Graduates with higher degrees preferred. Rural location. Excellent benefits. Re-location assistance. Ref. 754

Design Engineers

Hants., Somerset to £12K

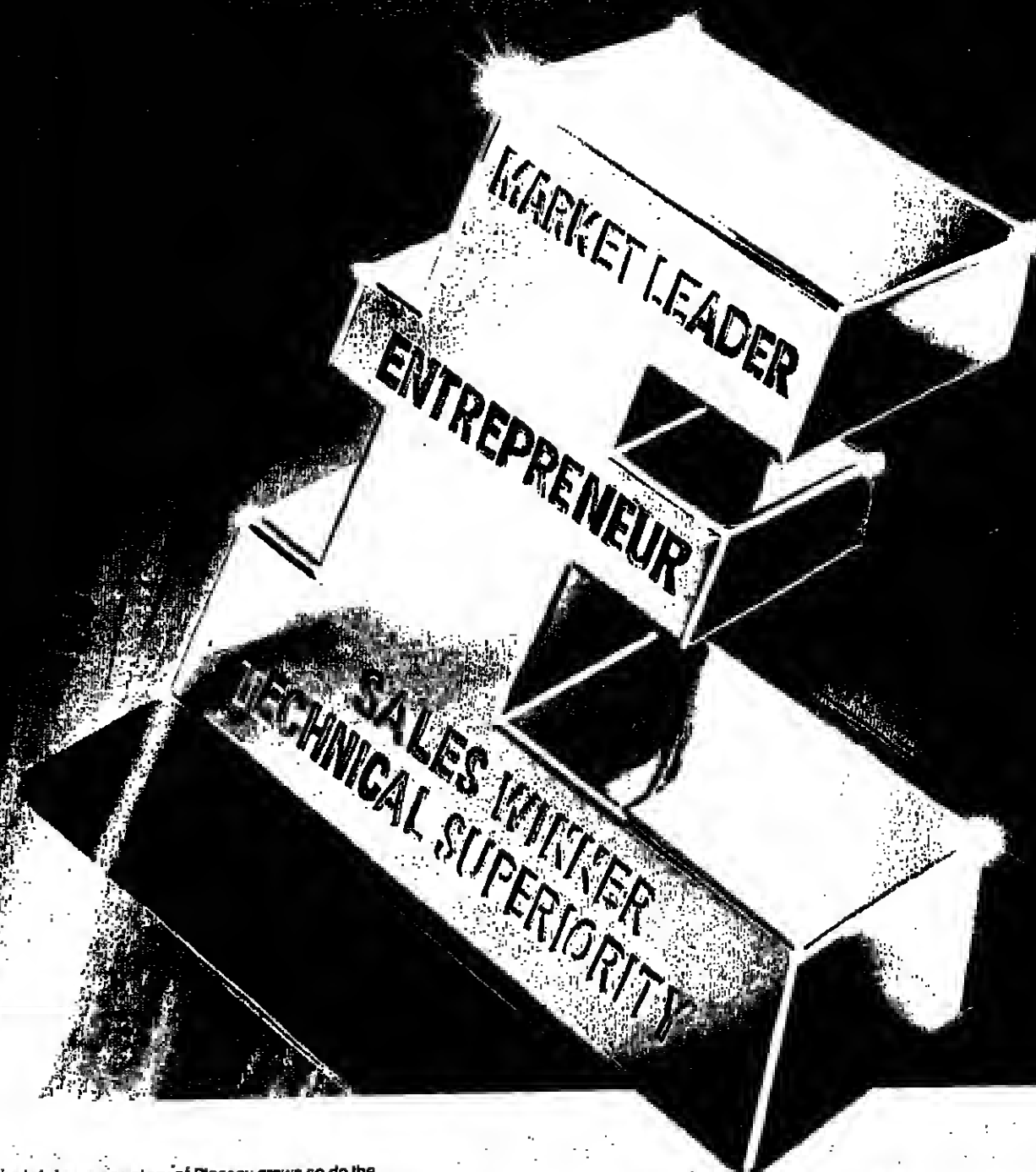
Major companies developing a variety of military applications seek hardware design engineers with broad based experience in control systems/datalogging/instrumentation/automation or similar applications. Candidates aged 24-35 years, must have HND/HNC degrees and some software experience. Attractive locations. Good benefits. Re-location assistance. Ref. 750

Real Time Engineers

West, South, Wales to £10-£15K+

Major companies developing real time applications in telecommunications, process control, telemetry, industrial automation and military systems require experienced team members and project leaders. Computer Science/Engineering degrees essential, plus assembler and/or high level real time language experience. Excellent benefits. Re-location assistance. Ref. 614

SOFTWARE ENGINEERS GET YOUR SHARE of the PLESSEY SUCCESS



As the total success story of Plessey grows so do the opportunities and challenges for Software Professionals at our Digital Technology Design and Development Centre.

The prime function of the Centre is to create new products and convert others to fully exploit market opportunities. The Centre is very much a 'centre of excellence' playing an important role in keeping us well ahead of the competition in the particular fields of technology in which we excel. Typical examples of how we lead the market are Plessey ICX, which with its technical superiority, is now outstripping the opposition resulting in new and increased sales for us at home and abroad and CDSS (a small digital PABX) already a proven success and now rapidly winning more export orders.

We now require experienced software engineers to join existing compact development teams in the following important areas.

Software Design

to be responsible for the specification, design, implementation and test of software for real time operation and application of telephone and data switching systems.

The current range of projects includes: Basic operating system development, 'Expert' systems for maintenance and diagnostics, network control and management packages, on board software for microcontrollers, voice response systems.

Use is made of State Transition Diagrams and Structured English for specification and design. Both high and low level languages are used on mini and micro computers, appropriate to product and application.

Product Configuration Support

A number of programs are under development on our VAX11/780 to produce a flexible means of configuring our products from quotation to software and hardware production and beyond to systems extensions.

Programmers interested in this area should have experience of manipulating large data bases with a knowledge of VAX/VMS and PASCAL.

Software Products Support

A varied responsibility covering 3 major areas:
1. Maintenance of our software products in the field.
2. Adaptive Engineering to modify the standard system software to specific customer requirements.
3. Project Management - the estimating, planning, monitoring and co-ordinating of the major software development within the Department.

Software Quality Assurance

A well established team involved in all aspects of the software life cycle from requirement analysis to system test and post delivery maintenance. The primary roles are the development of standards and practices, and the assurance that the software products conform to these standards.

The Software Quality Engineers participate in requirement/specification playthroughs, design reviews, code walkthroughs, system testing, and software release. Planned activities include the development of metrics to assess the quality of specifications, designs and issued systems.

Software Support

Responsible for the provision of the tools, both HW and SW, required by the other groups for the development, production and support of switching software.

The team is responsible for the running and maintenance of development computers (Intel MDS, Data General ECLIPSE and DEC VAX 11/780), and the large central lab.
The Software tools provided range in application from micro-code assemblers to resource management packages.
Implementation of these tools being in ASSEMBLER, FORTRAN or PASCAL.

The Software Support Engineers need to be able to switch attention rapidly between differing, complex problems.

The Financial Package

Our terms of employment are first class with an attractive remuneration package and very generous financial assistance for those needing to relocate. The area offers excellent housing, educational, social and recreational facilities - our personnel department can tell you all about them in detail.
To enable you to gain first hand experience of the Plessey success in Nottingham we will be inviting selected applicants to spend a weekend with us. During this time you would be able to discuss projects with management, look around the Centre and explore and get a feeling for the locality.

Holiday Arrangements

We will honour all holiday arrangements of any Software Engineer joining us during the next few months.

If you would like to join us you should possess a first class qualification to degree level and have 2-3 years experience, (for the more senior posts 3-4 years or more). Knowledge of telecommunications desirable but not essential.

Talk to a professional like yourself.
Just pick up the phone, dial 0802 866522 ext. 2486 and have an informal chat with Roger Andrews, one of our software managers, between 12 noon and 7 pm about the stimulating projects we are currently working on and the others that are planned.

Alternatively send brief career details to: Bob Elden (Ref. QWP/809) Plessey Office Systems Limited, Abbeyfield Road, Nottingham NG7 2SZ.



Senior Systems Programmer

Up to £14,000 + Car + Benefits
Wiltshire

"Our Systems Programmers can exercise real influence on our computing future and in so doing greatly enhance their future prospects and technical abilities".

We would normally start this advertisement by saying what a hugely successful and progressive Company we are, but we are reliably informed that Systems Programmers are more interested in our computer installation and technical facilities.

So we'll start by telling you that we have an IBM 3081G and a 3031 (which incidentally is for systems programming use) running MVS/SP 1.3, ACF/VTAM, IMS/VS 1.2, TSO, APL, ROSCOE, SAS, and more than space here can tell. We also have laser printers, 8100 minis, 3750 telephone exchange and much more. Future plans include installing ACF2, ASM2, and DF/EF and evaluating DISOSS II, DBRC and ADF, as well as preparing for MVS/XA and IMS 1.3.

We would like to recruit a Senior Systems Programmer with at least 3 years systems programming experience most recently within an MVS environment and a good knowledge of at least one of: MVS, IMS, ACF/VTAM, 8100/DPCX, SMF/RMF data analysis and reporting, or software tuning.

If you think you may be interested, you'll probably want to know that we have built our highly successful Group of Companies around our computer facility and so a role within Technical Support is one of real influence and scope.

Add to all this the fact that we pay excellent salaries, with a substantial range of benefits including non-contributory pension, BUPA, profit sharing and full relocation to Wiltshire. This is an outstanding career opportunity - make sure you don't miss it.

To arrange a confidential interview, contact our Advisor at SCR, Martin Stainthorpe, on 021-236 3761 (24 hour answering service) or 021-744 1862 (Evenings 7-9pm and Weekends).

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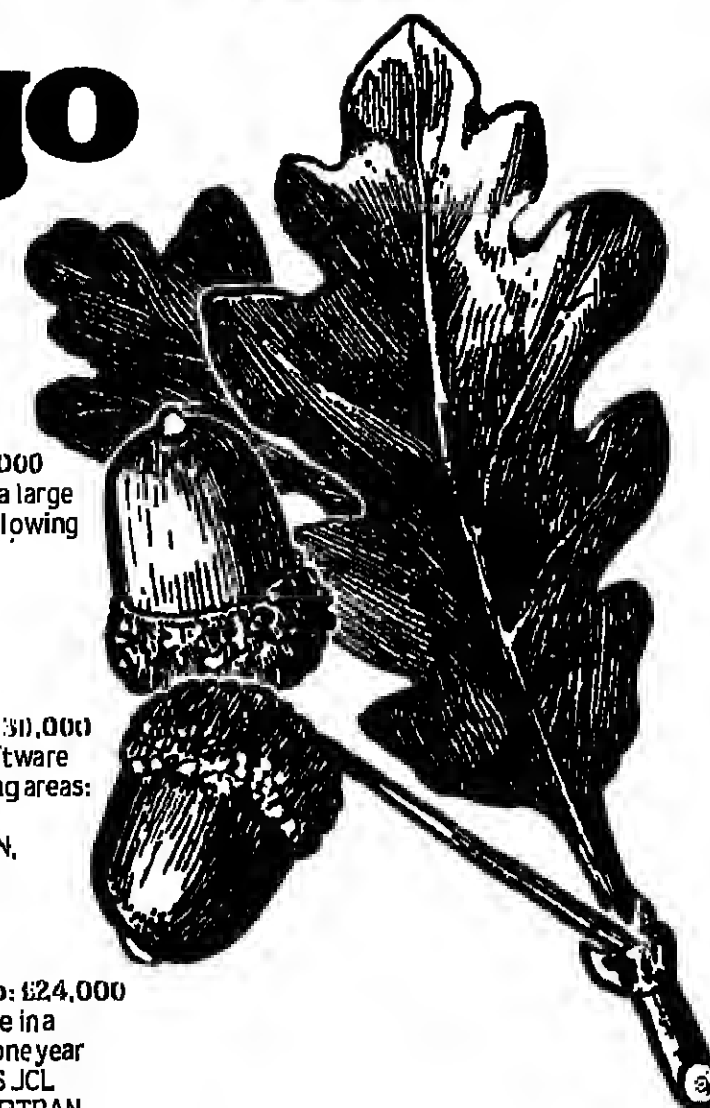
MIDLANDS & INTERNATIONAL
35-37 Great Charles Street,
Queensway, Birmingham B3 3JY
021-236 3761

NORTH
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Manchester M3 2ER
061-633 0427

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Comcap Resources Limited was originally launched some eighteen months ago, to provide the data processing industry with a comprehensive and reliable recruitment service.

Obviously in such a specialised market place both are of paramount importance and Comcap Resources offer without doubt one of the most flexible D.P. Recruitment services available today.

They have acted on behalf of numerous "Blue Chip" companies both in the UK and Overseas - placing the right people in the right jobs at the right time.

An indirect result of this ability to match people to position is a large number of unsolicited applications from other data processing staff who have seen just how reliable Comcap Resources are.

They have also benefited from the backing and experience of the Comcap Group who are major suppliers of IBM Computer Hardware throughout the business centres of Europe.

With this impressive profile they are continually extending their interests to Saudi Arabia, and now must rate as one of the most successful recruitment agencies in that part of the world.

As you can see they are currently recruiting several high level IBM Computer personnel on behalf of a leading international company, who boast one of the worlds most sophisticated 'state of the art' installations.

ANALYST PROGRAMMERS To: £24,000
Required Skills: At least three years experience in a large IBM environment with experience in one of the following areas:
PLI/FORTRAN - Engineering or Scientific
PLI, IMS, ADF - Commercial/Financial
MARK IV, TSO/SPF or SAS.

SYSTEMS PROGRAMMERS To: £30,000
Required Skills: A minimum of two years Pure Software Systems experience in one or more of the following areas:
DATA COMMUNICATIONS (NCP, VTAM, MSNF)
GENERAL PURPOSES SOFTWARE (PLI, FORTRAN, MARK IV)
OPERATING SYSTEMS (MVS, JES2/3, VM 370)

TRAINING CONSULTANTS To: £24,000
Required Skills: Minimum of two years experience in a large IBM mainframe environment plus at least one year teaching/training experience. Knowledge of MVS, JCL, TSO/SPF and Utilities, together with PLI and FORTRAN. Must be able to work with students for whom English is a second language.

OPERATIONS ANALYSTS To: £21,000
Required Skills: At least five years experience in a large IBM installation in some of the following areas: JCL (Dataflow procedures, Job flow control), SOFTWARE MONITORING SYSTEMS (Data reduction and Graphic presentation) DATA SECURITY (RACF or ACF/2) TSO, MVS, IMS, Change Control or Capacity Planning.

SENIOR OPERATORS To: £18,000
Required Skills: At least four years experience in a large IBM installation using MVS, JES2/3, TSO, JCL and Utilities. Or two years experience in a large VAX installation especially in the areas of Graphics output and Peripherals. In addition, the salaries carry all the tax advantages of working in Saudi Arabia and a benefits package which includes Free Air Fares, Free Transportation, Excellent Recreational Facilities and Free Accommodation.

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DISC

DEBENHAMS INTERACTIVE
SYSTEMS COMPANY LIMITED

The Company provides a wide range of computing services to a large client-base. The Data Cantra operates 2 x ICL 2966 mainframes (DME/G3), a number of microdata Raality/Sequoia minis, and an extensive communications network. We are experiencing significant growth in all of these services and we are therefore seeking the following staff:

COMPUTER OPERATIONS STAFF

Applicants should have at least 2 years operational experience, preferably with ICL mainframes, ideally G3, and will be prepared to work within our current shift pattern.

DATA COMMUNICATIONS TECHNICIAN

Candidates will have at least 2 years Data Communications, or appropriate British Telecoms, experience. Reporting to the Data Communications Manager, they will be self-motivated and capable of using initiative in the operation of this Department.

An attractive salary package, commensurate with experience, will be offered to the successful candidate.

Applications in writing please to:

Mr. S. A. Jackman, Personnel Manager
DISC
Bedford House, Park Street, Taunton
Somerset TA1 4DB

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Manchester - Birmingham - London £25,000 + Car

We have been retained by a prestigious software marketing company to assist with their recruitment programme. Their marketing success in the field of financial and manufacturing software systems on mini/microcomputers has created an urgent need for three young and ambitious Sales Executives. A minimum of three years' experience in selling business solutions to computer users is required for these positions. Telephone our Consultant now, quoting Ref: F73, to arrange an immediate confidential interview.

SALES MANAGER (DIRECTOR DESIGNATE)

London £27,500 + Car

An opportunity to move into Sales Management with a leading supplier of mini and micro computer systems. Our client is seeking an experienced Sales professional to manage and direct a young and highly successful sales force. Your experience will have been in the marketing of business systems to commercial users at the mini computer level. This is an excellent opportunity for a successful sales executive to demonstrate and improve his/her management skills. Contact our Consultant now, quoting Ref: F76, to discuss this attractive position.

SENIOR SALES ACCOUNT MANAGERS

U.K. £35,000 + Car

Our client, a major supplier of large mainframe and minicomputers is currently looking to expand its major Accounts Sales Division. They seek top sales professionals with a proven ability to handle existing key customer accounts. You should be able to show a successful track record in large system sales as a necessary prerequisite for these excellent opportunities. All mature and successful Sales Executives should contact us quoting Ref: F79 to arrange a confidential interview.

SYSTEMS DESIGNERS/ANALYSTS

Wiltshire c. £15,000 + Car + Excellent Packages

Our client, a major financial institution, currently undertaking a dynamic expansion programme has engaged our services in the recruitment of ten Designers and Analysts to assist in these major development projects. If you have the desire to expand your career with this rapid growth company and have a successful record of implementing large financial projects, you would benefit from an initial telephone call to our Consultant quoting Ref: J131.

ICL COBOL PROGRAMMERS

Wants to £9,500 + benefits

Our client, a household name, are developing their wide-ranging services facilities and are supplementing their development teams with 12 more Programmers. Can you offer commercial ICL COBOL experience under VME, DME or TME, or SCL? In return they can offer you the opportunity to gain Database experience on wide-ranging commercial applications, with excellent career prospects. Telephone our Consultant now quoting Ref: J117 for more information and to arrange an immediate, confidential interview.

CHIEF PROGRAMMER & PROGRAMMERS

Strive to £13,000 + Substantial benefits package

One of our most respected clients, a major insurance company, offers a unique career opportunity for a Programming Team Leader to take control of new project developments. This will encompass setting up standards and procedures and quality control of technical design and programming. You should be able to prove your extensive IBM COBOL Programming expertise in a DOS environment with CICS and DL1. Two Programmers are also required to supplement their programming team currently developing an on-line data-base system. If you have two years' IBM COBOL Programming experience with CICS and DL1, and seek the opportunity to widen your career potential, telephone our Consultant quoting Ref: J115.

If you believe your experience matches any one of the above criteria, then light up your future by contacting: Fred Bremley (Sales) or Peter Jozeph on Farnborough (0252) 516141 or write enclosing a detailed cv.

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38/44 VICTORIA ROAD, FARNBOROUGH,
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Saudi Arabia

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This is a challenging position with the operations team at the King Khalid National Guard Hospital in Jeddah. This is a 500-bed secondary referral hospital which is managed by the International Hospitals Group (IHG) in association with IAL.

The Hospital has comprehensive Administration, Patient Management, Patient Care and Laboratory Services systems - based on multiple linked 11/70s operating under RSTS/E and using DECNET. You would be responsible for operations during a shift; initiating systems; monitoring input and distributing output; informing users of system status and taking corrective action on central hardware or on a communications failure.

With your HNC or GCE 'A' levels you must have 2 years operating experience

including at least one year on a DEC PDP 11/70 installation.

The tax free salary of SR80,500 p.a. will be paid in Saudi Riyals (the conversion to sterling has been effected at the rate SR5.5=£1).

Benefits include free accommodation, 49 days annual holiday, free return flights to the UK and free medical care. Facilities include shops, gymnasium, theatre, swimming pool, tennis courts and restaurants.

Preference will be given to suitably qualified Saudi Arabian nationals and Arabic speaking personnel.

For further details please telephone Alexander Sneddon on 01-574 5432 or send your cv. to him at IAL, Aemdio House, Hayes Road, Southall, Middlesex, UB2 9N. Please quote ref. M092.

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Computer Project Leader

£13,900-£17,400

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We are seeking a suitably qualified Computer Project Leader for our Financial Accounts Department, based in Chesterfield.

Duties
The successful applicant will be responsible for computer project management including systems analysis, design and development, the design of software packages and the evaluation and implementation of accounting projects. Specific responsibilities will include development and field trials in local post offices of Revenue Billing and Cash Management; the development of accounting applications on various other types of equipment; participation in the evaluation of appropriate computer equipment; and also the effective leadership of a small team.

Qualifications
Candidates should have extensive computing experience with a minimum of 3 years proven management track record in the design and control of computer systems; considerable experience of manufacturers' hardware and software, specifically in the mini-computer ranges; and a working knowledge of COBOL. Experience of the NCR 9000 series, small business computers, and financial accounting systems would be an advantage. Personal qualities must include the ability to create team spirit and to deal successfully with people at all levels both inside and outside the Post Office.

Pay and Conditions
Starting salary will be in the range quoted. There is an excellent leave allowance and a contributory pension scheme. Application forms can be obtained from Mr. R. B. Lengford, PHO/PP7.2 Room 329, Post Office Headquarters, St. Martin's-le-Grand, LONDON EC1A 1HQ. (Tel. 01-432 4683). The closing date for applications is 30 days from publication date.

The Post Office

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Our clients in computer and electronic manufacturing, defence, oil and the offshore service companies urgently require graduate software engineers with a sound background in any of the following areas:

- real time applications • process control
- data communications • CAD/CAM • graphics
- data base techniques • microprocessor development systems

Opportunities exist in design, quality and product support and offer attractive salaries and benefits packages. To discuss these posts and the ways in which you can best develop your career in software, telephone Mark Reddish or Carol Sutherland.

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ANALYSTS AND CONSULTANTS TO £16,000 p.a. REAL TIME SYSTEMS

Spending five minutes completing the crossword will give you a clue to the exciting career prospects now available with our Client.

ACROSS

- It's not communications or command but its part of 'C'.
- Not odd.
- You will already have taken part in the development of one or more of these.
- Opposite of then.
- You complete the football one in the hope of winning millions. Fill in ours for an exciting new career.

DOWN

- You do it to your own career by applying to work on this new one.
- Order about.
- To put off as with the coupon below.
- One rank above Captain in the Army.

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New Opportunities South of England

£8,000-£14,000K + Car.
Recent extensive additions to their existing services have created, for our client, a need for a range of staff from programmers, designers and software specialists to support roles. Candidates should have experience (6 months +) of using PRIME systems in any one or more of these capacities, covering commercial, technical, automated office or scientific applications.

CONTACT DON KNAGGS

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£15,000K
Required to work in real time environments in communications, process control and defence industries on an interesting variety of projects. Candidates should possess a relevant degree/HNC or HND and have experience of one or more of the following languages: CORAL/PASCAL/FORTRAN/RTL.

CONTACT KEITH PENGELLY

Software Engineers/Designers/Programmers

London/Berkshire/Wiltshire/UK

£6,000-£14,000K

Our client is a major prestigious force in the most up-to-date sector of the industry covering military, defence, process control and CAD/CAM. They require hardware, software and support engineers, designers and programmers with experience of communications (real time) PL/M-86, C, CORAL, PASCAL, FORTRAN, Assembler, Pascal, ADA, etc.

If you have two to four years' experience or more and ideally a HNC/HND or degree then this rare opportunity should not be missed.

CONTACT
KEITH PENGELLY
TIM BRIDGES

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Home Counties

£12,000-£16,000K

A prestigious client is seeking Project Leaders with current expertise in the specification and design of software, through to NC systems. A background in engineering, coupled with NC and mechanical design, is vital for these exacting roles in a dynamic company with an exciting new product range.

CONTACT JEFF BOWMAN

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U.K. Wide

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CONTACT TIM BRIDGES

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Bristol

£20,000K +

Experienced professionals are sought for the Bristol branch of our client, with a successful track record in the sales of commercial systems to end users in a new business environment. Prospects are excellent for advancement in this major company.

CONTACT JEFF BOWMAN

Communications Programmers

Hartfordshire

To £13,000K

Data Comm real time programmers are required for this manufacturer. We are interested in hearing from candidates who wish to advance their careers into one of the following specialisations - comm processors, mainframe protocols, X.25, PAD, LANs.

CONTACT TIM BRIDGES

KEITH PENGELLY
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CITY

We are seeking self-motivated people with a minimum of 2 years DP experience to join our expanding Department.

The system consists of four loosely linked Honeywell DPS6 minis supporting over 100 TDS colour terminals, a fifth machine is currently on order. We are concerned mainly with Motor Insurance Underwriting incorporating comprehensive claims and accounting facilities.

Applicants for the programming positions should have a good working knowledge of either Screenwrite or Cobol, whereas experience of both languages will be required for the senior positions.

We offer a competitive salary supported by a substantial range of fringe benefits associated with a major company.

If you are interested in an exciting and challenging career and are seeking opportunity and responsibility, please write giving brief details to:

Mr. R. Neil
Programming Manager (CW)
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Guarantee Corporation
5-11 Fetter Lane
London EC4P 4NA



Real-Time Software Development

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plus exceptional benefits

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The organisation is a world leader in the field of advanced telecommunications and control systems. As a result of continued success in home and international markets, they are expanding their software team by appointing a number of Engineers at various levels.

In this development environment, both high and low level languages are utilised on a range of mini and micro computers. The techniques used relate closely to such areas as electronic mail and the automated office and the skills to be gained will thus be most valuable in years to come.

Vacancies exist for Software Engineers, with a minimum of two years' experience, through to Chief Engineer, a level which demands past responsibility for the development of a full project.

High basic salaries may be enhanced by generous allowances for a voluntary, but particularly convenient shift system which does not involve night work. There is also substantial, again voluntary, paid overtime available. Comprehensive benefits include a very generous relocation package to a sought-after area which features excellent amenities and well-priced housing.

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With an eye for an
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We require COBOL and ADF Programmers to support the development and expansion of our batch and on-line systems. Experience of an IBM environment is not essential and training will be given where necessary, however a knowledge of MVS, TSO/SPF or IMS/DB and DC would be an advantage.

Applicants for Programmer/Analyst posts should have a minimum of 2 1/2 years programming experience, which may have been in a manufacturing or commercial environment, and be looking to gain analysis and design exposure. Candidates with more than 4 years programming or analysis experience will be considered for the senior posts, which will also require staffing and project management skills.

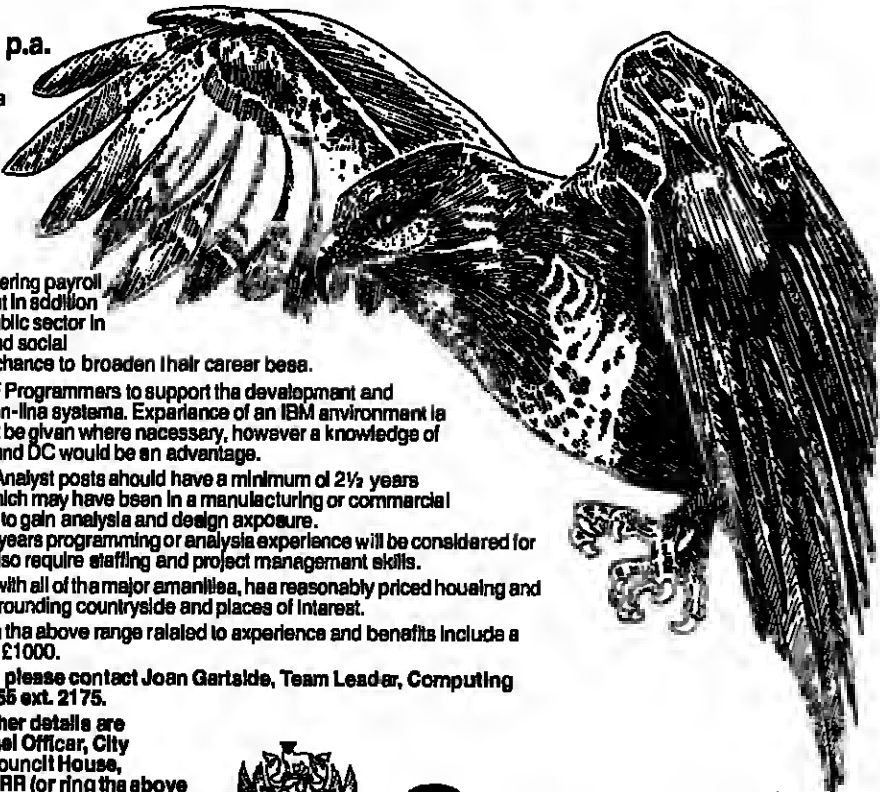
Coventry is an attractive city with all of the major amenities, has reasonably priced housing and offers easy access to the surrounding countryside and places of interest.

Salaries will be offered within the above range related to experience and benefits include a relocation allowance of up to £1000.

For an informal discussion please contact Joan Gartside, Team Leader, Computing Services Unit, on 0203 25565 ext. 2175.

Application forms and further details are available from the Personnel Officer, City Treasurer's Department, Council House, Earl Street, Coventry CV1 1RR (or ring the above number).

Closing date for applications will be Friday 8th July 1988.



Coventry

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Challenging assignments for experienced Analysts and Programmers in North of England, Midlands, West Country and Europa.

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Telephone: Wilmshurst (0825) 532127. 1000

DO YOU WANT TO WORK FOR A SUCCESSFUL COMPANY OFFERING A SECURE FUTURE?

Barclays Bank is recruiting high calibre Systems Analysts and Programmers for their Data Processing areas. Opportunities exist at Knutsford (Cheshire), Northampton and Poole (Dorset).

Starting salaries are likely to be in the range of £7,000 to £13,000 p.a. depending upon experience. Our experienced staff can achieve salaries of £17,000 and beyond.

Applications are invited from analysts and programmers who have a minimum of 2/3 years experience within large scale IBM environments. A knowledge of COBOL and/or ASSEMBLER is required, preferably on large mainframe IBM equipment under MVS. Experience of large developments with batch or on-line systems using structured programming techniques would be an advantage, as would a knowledge of financial systems, TSO using SP/ and IMS.

If you have a thorough knowledge of Database techniques under IMS, positions of significant opportunity are awaiting.

There is varied, interesting development work embracing many different disciplines and applications. Real career opportunities exist in expanding Data Processing areas.

The remuneration is excellent and includes good basic salaries, a non-contributory pension scheme, paid overtime or flexitime, an annual bonus and Profit Sharing. There are subsidised restaurants at all three locations.

Application forms may be obtained from:

K. J. Colebrook, Manager (Personnel),
Radbrooke Hall, Knutsford, Cheshire WA16 9EU
or telephone Knutsford (0565) 3888 Ext 2743, 2744 or 2745.
Initial interviews will be arranged in Cheshire, Northampton and Poole.

BARCLAYS

Logica to £20,000

Logica specialises in information technology. We have built up an impressive concentration of skills in real-time computing, communications and office automation. We have recently been selected by Computing as the Company of the Decade in the software industry. Our work ranges from total system implementations to short consultancy assignments. We concentrate on leading edge developments providing staff with varied, advanced and technically demanding work.

To continue our growth, we seek further top-class London based professionals. For the senior positions below, you are likely to have a degree, but more important is a record of achievement in your chosen discipline. We look for commercial awareness, the ability to communicate effectively, and the flexibility and confidence to undertake a variety of work. You will also possess flair, drive and self-sufficiency. All these positions require close working relationships with senior client management.

Capacity Management Consultant

We are seeking an individual to head up one of our fastest growing areas of specialisation. You will possess extensive DP experience in systems programming and applications development ideally supplemented by work on capacity planning, sizing, performance evaluation or system tuning. In addition you should have thorough working knowledge of at least one major operating system.

IBM Systems Consultants

These senior positions require comprehensive IBM system experience covering both mainframes and communications. You will be responsible for conducting a wide variety of assignments including computer strategy studies, system tender evaluations and system design studies involving large networks with IBM (or IBM look-alike) mainframes, database management systems and distributed processing.

Project Managers

We expect strong technical capability, typically on large minis, and the ability to motivate and lead a team. Experience of estimating, resourcing, project planning and control, and project standards are essential. Knowledge of structured design and system productivity aids would be advantageous.

If you are looking for a challenging environment and believe you can contribute to a worldwide successful systems company, please contact Louise Romain, our Recruiting Consultant, on 01-407 2531 (day and evening) or write to her at Logica Limited, 64 Newman Street, London W1A 4SE.

Louise Romain
01-407 2531

TO
ADVERTISE
IN OP SPOT
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JAMES
ATTEWELL
01-587 5541

real time
DEVELOPMENTS LIMITED

**SOFTWARE
ENGINEERS
CONSULTANTS**

£11-£14,000

Real Time Developments are a highly successful company with a commitment to providing quality software services to a wide range of organisations. Increased business has created a requirement for a number of highly motivated and adaptable Software Engineers and Consultants.

Candidates should have a background in mini/micro computers particularly DEC, INTEL, ZILOG, MOTOROLA etc. and possess at least five years' experience using both high level and assembler languages. A knowledge of Real Time Software, Data Communications or Industrial Automation would be highly advantageous.

The successful candidates will occupy positions of responsibility, including team leadership, with ample opportunity to broaden technical experience. As a thriving and expanding company, Real Time Developments offer competitive salaries and attractive conditions of employment which will include relocation assistance where necessary.

LOCATION: HAMPSHIRE

JA 390/1



**PROGRAMMERS
ANALYST/
PROGRAMMERS
PROJECT
LEADER**

to £14,000
company car

Kenrick Computing Ltd., a member of the Kenrick Group of companies, provides a variety of computer services to commerce and industry. These include package and tailor-made systems, bureau services and total turnkey solutions based on the complete range of Data General computers. Since the company's formation in 1978, Kenrick Computing have seen substantial growth in their client base and now have a requirement for a range of staff from Programmer through to Project Leader.

Candidates should have in depth programming skills gained in a mini-computer environment, preferably Data General using Business Basic. A knowledge of production systems would be highly advantageous. The positions involve substantial customer contact and the successful applicants must be able to demonstrate the ability to liaise effectively at all levels.

In return, Kenrick Computing offer excellent salaries and the use of a company car.

LOCATION: WEST MIDLANDS

JA 390/2



**GOULD
Electronics
SOFTWARE
ANALYSTS**

£ excellent
Company Car

Gould S.E.I. is a world leading manufacturer of 32-bit minicomputers. The software support team plays a vital role in the increasing demand for the company's products. Vacancies exist for Software Analysts to expand the team responsible for UK and Northern Europe software support. Experience is required in two areas:

Scientific, Technical and Real Time - applicants should have 4-5 years' experience in a scientific, industrial or Real Time environment and be fully conversant with operating systems and communication software, scientific high level languages and/or assemblers.

UNIX and C - applicants should have in depth experience of UNIX and/or C and will be involved in a challenging role of pre- and post-sales support of UNIX and its associated products.

We offer excellent salaries, company car and a range of benefits normally associated with an organisation of our standing.

LOCATION: SURREY

JA 390/3

**RECRUITMENT
CONSULTANT**

WEST LONDON

1000

DP Recruitment Consultant is a leading firm in the recruitment industry, with a strong reputation for finding the right people for the right jobs. Our consultants are experienced and professional, and we are looking for more people to join our team.

We are seeking experienced and motivated individuals to join our team of consultants. The successful candidate will be responsible for finding and recruiting top talent for our clients.

For an initial interview, please contact our Recruitment Consultant on 01-407 2531 or write to her at Logica Limited, 64 Newman Street, London W1A 4SE.

The address below is for the Recruitment Consultant only. Please do not write to this address if you are not interested in the position.

Action..

ring or send the coupon to:
D.P. Recruitment
Services Ltd.
Freeport, London W5 2ST
01-587 5501

Name
Address
Home tel. Work tel. Ext.
I am interested in Ref.

Outstanding Opportunities in New Product Design South Hertfordshire



Northern Telecom Data Systems is one of the top six suppliers of advanced DDP/automated office systems in Europe and constitutes a key element in a \$3 billion North American Corporation. Over \$1 billion is currently committed to applied R&D worldwide in order to protect our lead in communications and advanced information handling technology. A new family of office automation products, specifically designed for the European market is currently being developed at a new research and development centre in South Hertfordshire and a number of new positions have been created to address the hardware aspects of the new systems.

Hardware and Peripheral Integration

Candidates for these positions should be able to demonstrate in-depth understanding of the peripheral components of modern high-speed DP systems. Of particular interest are skills in evaluating design and performance features and integrating them into the total system. Preference will be given to candidates with a recognised electrical and/or electronic engineering qualification supplemented by several years practical experience with a sizeable minicomputer manufacturer.

The positions will be based in an attractive modern purpose-built centre designed to facilitate ease of liaison between other technicians on the project. Additional to an attractive salary, the appointments carry a generous relocation package where applicable and a range of other benefits befitting a market leader.

Telephone our Advising Consultant **Alan Carnell** on **01-935 0671** (24 hour answering service) or **01-486 0877** after hours to arrange a prompt and confidential interview. If you so wish please submit your Curriculum Vitae to him at SCR's London office.

Specialist Computer Recruitment Ltd

SOUTH
James House, 4th James Street
London W1A 5LS
01-935 0571/486 0461

MIDLANDS & INTERNATIONAL
26-27 Great Charles Street
Leicester LE1 5AB
021-236 3701

NORTH
International House, 4th Floor
Manchester M1 1BB
061-833 0427

BELGIUM
Avenue Louise 37
1050 Brussels
010 322 640 7151-71

HOLLAND
Willemsparkweg 92
1077 H.M. Amsterdam
010 3120-760947

Stockbroking City of London

Twice-yearly bonus

This progressive stockbroking firm has been operating since the turn of the century and was a pioneer in the use of economic analysis in investment decisions. They were also among the first stockbroking firms to deal extensively overseas and to advise clients to include overseas investments in their portfolios. As well as the usual broking services, they offer professional expertise in the following areas:

- Investment/Portfolio Management
- Investment Planning
- Economic Analysis
- Economic Research
- Gilt-Edged Market
- Overseas Investment
- Company Launch

The DP department is now well established, having developed its own standards and structured approach, yet has remained small—about a dozen—friendly and enthusiastic. They use DEC and HP equipment.

In addition to good salaries, a bonus is paid *twice-yearly* and staff are eligible immediately. These bonuses add significantly to individual's remuneration.

Please contact **JOAN AINSWORTH** on 01-681 8311 or write to her at: C.S.S., 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey CR0 9XF.

Analyst/Programmer £10-12,000

Following its planned expansion path, the DP department is now looking for an analyst/programmer of good academic background, able to be responsible for their own part of a project from start to finish.

User contact plays a large part in the day-to-day activities of the department, placing requirements over and above those of technical skills on applicants. These interpersonal skills and an alert mind are more important than particular hardware and software experience, although obviously, any previous experience in the financial sector and knowledge of BASIC-2, would be very useful. If you have 1-3 years' experience and would like to contribute to the further success of DP within the partnership, we should like to hear from you.

OPERATING SYSTEMS SPECIALIST

VAX/VMS—To £18,000 + Car

One of the major UK Systems Houses, in the SOUTHERN HOME COUNTIES, is seeking a Senior OPERATING SYSTEMS SPECIALIST with an in-depth knowledge of the VAX/VMS and other DEC Operating Systems.

You will be a technical authority, providing specialist knowledge in configuring, sizing and tuning VAX/VMS systems. These systems will span Command and Control in civil and military environments, commercial systems and general information processing projects.

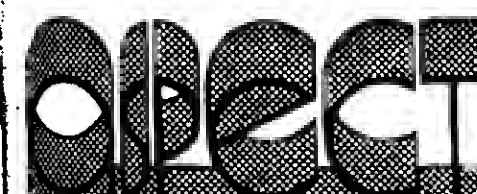
In addition to your specialist VAX knowledge, you may be called upon to do real-time systems design, development and implementation. Programming ability in modern realtime languages or COBOL, plus a knowledge of MASCOT would be a bonus.

Please telephone **JOHN WILLS** at IMPC Limited on 01-486 8644 to progress your interest.



Top Jobs For Top Software People Insight Marketing & Personnel Consultants

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computer recruitment limited

IBM OPPORTUNITIES

PL/1 PROGRAMMERS **C. LONDON** **to £14,000**
Major expansion within this progressive company has led to vacancies for all levels of programmers. Opportunities exist within the development teams for applicants with a minimum of 18 MONTHS' PL/1 experience, and up to FOUR YEARS' experience for Team Leaders. Our client retains large IBM mainframes running under MVS, using CICS and IMS, training offered where necessary.

COBOL ANALYST/PROGRAMMERS **LONDON** **£12,000**
This well-known company offers fantastic opportunities for individuals with a minimum of THREE YEARS' COBOL and some PL/1 experience. The client retains IBM 4341 hardware running under DOS/VSE, they offer TRAINING in CICS, loads of system development work and career progression. You will be involved in new projects and handle the training of junior staff.

PL/1 ANALYST PROGRAMMERS **LONDON** **£16,000**
This international company has two openings for career-minded individuals. If you have a minimum of 2½ YEARS' PL/1 experience, and wish to work on a variety of systems, have loads of client contact, and hold a responsible position please now for further details. Training offered in TP and DATABASE.

COBOL PROGRAMMER **C. LONDON** **£10,500**
This prestigious firm of merchant bankers based in the city can offer an exciting career move for a programmer with a minimum of 18 MONTHS' IBM COBOL experience. Ideal applicants should be in their 20s, ambitious and looking to progress into analysis. In return the company offers TRAINING in CICS and PL/1 and excellent benefits including subsidised mortgage.

COBOL PROGRAMMERS **LONDON** **£11,000**
This Central London-based company seeks to recruit two programmers with a minimum of TWO YEARS' COBOL including SIX MONTHS' CICS EXPERIENCE. This prestigious company offers TRAINING in PL/1 and analysis, and a variety of commercial systems. Excellent career prospects and benefit package.

ANALYSTS **LONDON & HOME COUNTIES** **to £18,000**
We have at present many requirements for ANALYSTS, SENIOR ANALYSTS, and PROJECT LEADERS for some of the largest companies in London and the Home Counties. If you have good analysis skills and are thinking of changing your position—why not call us now to discuss your future career.

15 Red Lion Square
London WC1R 4QH
Tel: 01-486 8644

Project Leaders Real Time Development

The Next Step?

Thames Valley £16k + Car

The Company are the world leaders in their field, developing real time control systems. They are an autonomous subsidiary of a major U.S. Corporation, which has world wide interests in the High Technology Industries.

Software development is a vitally important part of their operation, and there has been considerable progress within this department over recent years.

The stage has now been reached where we need to recruit a software specialist to lead the software team.

The candidates we seek will have a strong background in software development, seeking to take their next career step into management.

One of the major development areas within the Company is real-time software for PDP11 systems. The Company has its own VAX and PDP11s for this work.

The department is also responsible for developing software from single chip through to 8/16 bit microprocessors.

The successful candidate is likely to be in his/her 20's-mid 30's. A technical background relative to the systems mentioned is essential, as is the ability to motivate and manage a small team of software specialists with a wide range of responsibilities.

The benefit package is excellent, and full relocation costs will be met, where appropriate.

If you would like to discuss the opportunity further, contact Arthur Hunt, on (0628) 21723.

Harrison Cowley Executive Selection

35 Queen Square, Bristol BS1 4LU
Tel: 0272 36720 (24 hr. answering service).

Computer Search & Selection (Southern) Ltd

RPG III TECHNICAL PROGRAMMER To £11,000
Highly successful financial services company in North West London, seeking a competent Programmer with two years' + RPG III experience, and a bias towards the technical aspects of programming. This is a rapidly expanding young company who offer an excellent opportunity to self-motivated individuals. Current systems are being developed on a System 38 model 7, utilizing on-line and database facilities. Ref. C2033

IBM SYSTEM 34 HERTS £10,000 +
A major electrical organisation are seeking to recruit an Analyst/Programmer with a minimum of 18 months' RPG II experience. You will be working in a small D.P. Department, directly assisting the D.I.M., and will be involved with maintaining the existing software and developing a new stock control system. Due to expansion the company may possibly upgrade to IBM System 36 or 38 in the near future. Excellent benefits include non-contributory pension scheme and free BUPA. Ref. G2521

PROGRAMMER LONDON c. £8,000
Marketing company in Central London require an IBM System 34 Programmer with 12 months' + RPG II experience, and the ability to learn and progress within their department. As part of a young friendly team you will be developing a range of commercial applications in an on-line environment, and they offer five weeks' holiday, travel loans and lunch allowance. Ref. C2465

IBM OPPORTUNITIES

TEAM LEADER CITY To £13,000
New position within established City finance/shippping organisation, for a programming Team Leader capable of controlling a large-scale on-line programming development team. The project utilizes IBM 3033, and online computers, with MVS, TSO/SPF, IMS DB/DC, and COBOL, and X25 communication links. You should have a good standard of education, five years' + IBM experience, and database, mini-computer or supervisory knowledge. You will be reporting to a project leader, and it is expected that the department will increase significantly in size this year. Ref. C2463

IBM COBOL HERTS £9,000
Work with a professional team developing a large database system. Initially the emphasis will be on programming but shortly you will be writing your own specifications and dealing with user requirements. The company runs IBM 3033, and 4000 mainframes under DOS/VSE VM/CMS, with their own TP monitor which is similar to CICS. Benefits are those which would be expected from a multinational organisation and career prospects are unlimited. Ref. G2089

MOVE INTO ANALYSIS LONDON To £10,700
Worldwide oil company in Central London running IBM 3031/3033 with MVS, CICS and DL/I is offering the opportunity for an Analyst/Programmer to move into a pure analysis role. If you are young, ambitious, well educated and have around two years' IBM COBOL experience gained in an MVS, CICS, DL/I environment, this is an excellent opportunity to increase your horizon and design skills in a dynamic organisation. Excellent package including health and life insurance, subsidised residential travel loan, etc. Ref. C2387

OTHERS

HEWLETT PACKARD-COBOL To £8,500
Excellent opportunity for a Junior HP 3000 Programmer to further his/her knowledge, whilst developing an exciting and sound career. If you can offer six months' + HP COBOL experience, hopefully but not necessarily have a BSc (MSc, VET and Q&EP) then we would like to hear from you. My client, an international Banks based overseas, is expanding its European division. You will work on highly advanced development projects, and be asked upon to travel abroad. An excellent salary is offered and the package includes relocation. Ref. A2477

ICL COBOL MIDDLESEX £8,000
Commercial organisation currently holding an ICL 2800 running under GEORGE II with ICL COBOL and FILETAG and currently seeking a Programmer to help support conversion work from ICL to Burroughs mainframe. You should have a minimum of 12 months' experience in COBOL, FILETAG and GE. Initially you will be responsible for working solely on ICL programs but in 12 months' time you will remain on Burroughs equipment and join a fast-moving busy development team. Ref. D 2276

BURROUGHS - SENIOR £ NEG
Ambitious people with a valid BURROUGHS background will be offered a position leading on Systems Analysis experience are sought by this fast-paced marketing company. You will have the full and right to enable you to communicate with Management and Users, besides overseeing a team of D.P. staff. The company houses a 1985 on-line mainframe DMS II. Career prospects are above average and almost all work is development based. An excellent remuneration package is offered. Ref. A 2263

ICL ME29 CITY To £10,500
This is an excellent opportunity for a Programmer to take up a key position within this well-established insurance company. The company houses 2x ICL ME29 running under IME. Applicants should have a minimum of 18 months' ICL COBOL experience, with extensive exposure to TPS. You will play an integral part in user training, coding, design and implementation of a range of insurance and business systems. This is a new position offering career prospects, in-house education, exciting development projects, and a pleasant and flexible working environment. Excellent package including subsidised holidays and four weeks' holiday. Ref. D 2452

SYSTEMS ANALYST SURREY To £13,000
Large progressive manufacturing company based in Surrey housing an ICL 2800 are seeking an experienced Analyst such as at least two years' commercial D.P. experience. You will have spent the last two years working as a Systems Analyst and must be able to personify skills in the manufacturing sector. A programming background is preferred for this position. You will be using TP extensively, and working mainly with real time systems. Full company benefit package including relocation where appropriate. Ref. C2467

IBM PL/1 MIDDLESEX £ NEGOTIABLE
Applications are invited from Analyst/Programmer with extensive experience in IBM PL/1 experience, preferably in a commercial environment. The position is an IBM 4341 running under VM/CMS, DOS/VSE with POZ/ETC using CICS. All new developments are written in PL/1 using on-line facilities. You will be mainly working on development of new systems and full on production control, order entry, inventory, etc. Excellent company benefits including Pension Scheme, Travel Allowance and Industrial Contribution. Ref. D 2502

ENGLEDOWN ASSOCIATES

Computer Personnel Consultants

01-247 3356 (24 hrs)

Brushfield House, Brushfield Street,
Bishopsgate, London E1 6AN

Part Of a Technical Services Group Est 1969

Challenging appointments with a fast-moving computer specialist!

Quadra, a wholly-owned subsidiary of the multi-million Glass House Group, are a leading national computer software, hardware and service organisation - specialising in NCR 1 and 2 and operating from offices in London, Edinburgh and South Yorkshire.

GENERAL MANAGER (CONTRACTS)

South Yorkshire-based - up to £20,000 per annum plus executive car. A dynamic, experienced computer person, you will be capable of originating and motivating a highly skilled group of analysts/programmers working on projects throughout the UK. You will liaise with our clients and play a full role in corporate development and policy making. Successful performance should lead to an early board appointment. Ref. G2092

SYSTEMS ANALYSTS/PROGRAMMERS

South Yorkshire, London, Edinburgh and Birmingham - £10,000 to £13,000 per annum plus company car where appropriate. We want people who count both systems analysis and programming among their abilities. You will need to be self-motivating, willing to work on your own initiative and able to discuss clearly needs with clients. We reward hard work and need staff who can develop as a team. All appointments carry with them excellent fringe benefits commensurate with a highly successful and progressive Group of Companies. Ref. G2285

IBM COBOL BERKS/MIDDLESEX

To £10,500
There are many excellent positions available in Berkshire, Middlesex and West London for IBM Programmers and Analyst/Programmers, in the financial, retail, manufacturing and entertainment areas. If you can offer 18 months' to two years' experience of IBM COBOL, with either MVS, OS/VS1, or DOS/VSE and preferably on-line or database experience, then mail us now for further details of these exciting opportunities. Ref. C2349

BUSINESS ANALYSTS/PROJECT LEADERS

To £16,000
Due to expansion a large retail organisation are seeking additional Analysts and Project Leaders. The ideal candidates will be graduates, with an IBM background, and preferably with CICS and DL/I experience. Project Leaders will require strong leadership abilities and good technical background. Business Analysts (junior and senior levels) will be working independently or within small teams, and will deal with problem solving and work through feasibility, systems design and development to successful implementation. Ref. G2518

URGENT CONTRACTS

ANAL/PROGS SYSTEM 34 Rpg II LONDON/CROYDON

ANAL/PROGS IBM IMS DB/DC/ COBOL SURREY

IBM ODS VSE SYSTEMS PROGRAMMER LONDON

For further details contact NIC POLAND TLP (071) 478 1111

A division of Tate & Lyle Industries Ltd. Telephone 01-686 5656
Leon House, High Street Croydon CR9 3NH
A member of the Tate & Lyle PLC Group

Systems Analyst/Programmer

The Perkin-Elmer Corporation is known the world over and recognised as one of the leading manufacturers of advanced analytical instruments used in industrial, medical and academic fields.

We require a Systems Analyst/Programmer to join our Computer Aided Chemistry European Support Group based in Beaconsfield.

This group has the responsibility for the sale and promotion of our complete laboratory information management system - comprising turnkey software and a Perkin-Elmer 3200 Megamini computer.

Candidates should have at least 3 years programming experience using Fortran and Basic. Ideally in a scientific environment and be familiar with Data Base Management techniques. Knowledge of a European language, however slight, would be an advantage. A willingness to travel is desirable.

In addition to an excellent salary, the Company offers the usual terms and conditions expected of a large multi-national Corporation.

For further details and an application form please write or telephone: Mrs J. E. Stubbsfield, Personnel Officer, Perkin-Elmer Limited, Post Office Lane, Beaconsfield, Bucks. Tel: Beaconsfield 6161.

PERKIN-ELMER

RTZ Computer Software

cli CONFIDENTIAL REPLY SERVICE

X-DATA

A Subsidiary of Dyneer CORPORATION

cli recruitment advertising

ANALYST/PROGRAMMER

Bristol

System 34/RPG II

RTZ Computer Services Limited are a leading financial computer software company. An analyst/programmer is required in Bristol to work on IBM System 34 developing accounting packages. The person will subsequently progress into a development/support role. Candidates must have at least 2 years experience with IBM System 34, RPG II, and have been involved in design and implementation of systems. Conditions of employment are excellent, and includes generous relocation package and highly competitive salary.

Ref. MB 1/01

NETWORK SYSTEM SALES

c. £40,000 O/T + Car, c. £80,000 achievable

U.S.A. Training

A relatively new company to the UK market, our client is the European subsidiary of an exceptionally high-growth American company. Success has already been tasted in the sales of their computer networking systems predominantly in the large IBM user-market. Now with increased local support they are looking to expand their sales team with a professional sales executive who, following training within one of the major computer vendors, has had experience within the IBM Plug-compatible field and, ideally, some knowledge of communications protocols and methodologies. The area to be covered is the key Western Home Counties territory from which, historically, management opportunities have been highest.

Ref. CRS 1/02

PRINTER SALES PROFESSIONAL

c. £22,000

Executive Car

One of the UK's leading peripheral suppliers, we are an autonomous and high growth subsidiary of a major international company. With exciting new products being launched, we now seek experienced and professional sales executives to promote a wide and competitively priced range of equipment in the Midlands. To take full advantage of the outstanding career opportunities you must be able to demonstrate a highly successful track record, ideally gained in the peripheral OEM market place.

If you are successful and plan to grow, we offer high basic salaries, realistic targets and an executive car along with the security of a non-contributory pension scheme and permanent health insurance.

Ref. MB 1/03

SALES SERVICES MANAGER

£12,000-£14,000

Executive Car

Due to exceptional growth, we require an experienced sales service professional to oversee the effective running of our busy sales office. In addition to day to day administrative control, the successful candidate will be involved in longer term product planning and logistics. This will include liaison with other departments to ensure that customer deliveries are made in a timely and efficient manner.

This is a key and creative role in a highly successful organisation where customer support is paramount. The salary and benefits package reflects this and includes an executive car, non-contributory pension scheme and permanent health insurance.

Ref. MB 1/04

To Apply: Please write enclosing a full curriculum vitae or written details of your experience and qualifications to C.L.I. Recruitment Advertising, 27 Marlow Road, Maidenhead, Berkshire. Please quote the appropriate reference number(s) on the envelope. Alternatively telephone Maidenhead (0628) 36823 for an application form.

Licensed by Department of Employment No. BE 7082

GRAMPIAN HEALTH BOARD

SENIOR PROGRAMMER/ANALYST (£8,367 to £10,277)

PROGRAMMER/ANALYST (£7,404 to £9,025)

An opportunity has arisen for experienced and well qualified applications development staff to join the Computer Department of the Grampian Health Board. A full range of applications, covering financial, administrative and medical aspects of the Board's activities, are currently run on two ICL 2904s, a CIL 8048 and a number of other minicomputers. In 1983 the Board will take delivery of an ICL 2904S and a number of other minicomputers. In 1984 the Board will take delivery of an ICL 2904S and a number of other minicomputers. In 1985 the Board will take delivery of an ICL 2904S and a number of other minicomputers. In 1986 the Board will take delivery of an ICL 2904S and a number of other minicomputers. In 1987 the Board will take delivery of an ICL 2904S and a number of other minicomputers. In 1988 the Board will take delivery of an ICL 2904S and a number of other minicomputers. In 1989 the Board will take delivery of an ICL 2904S and a number of other minicomputers. 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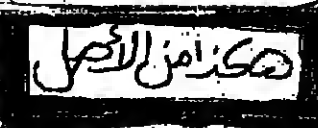
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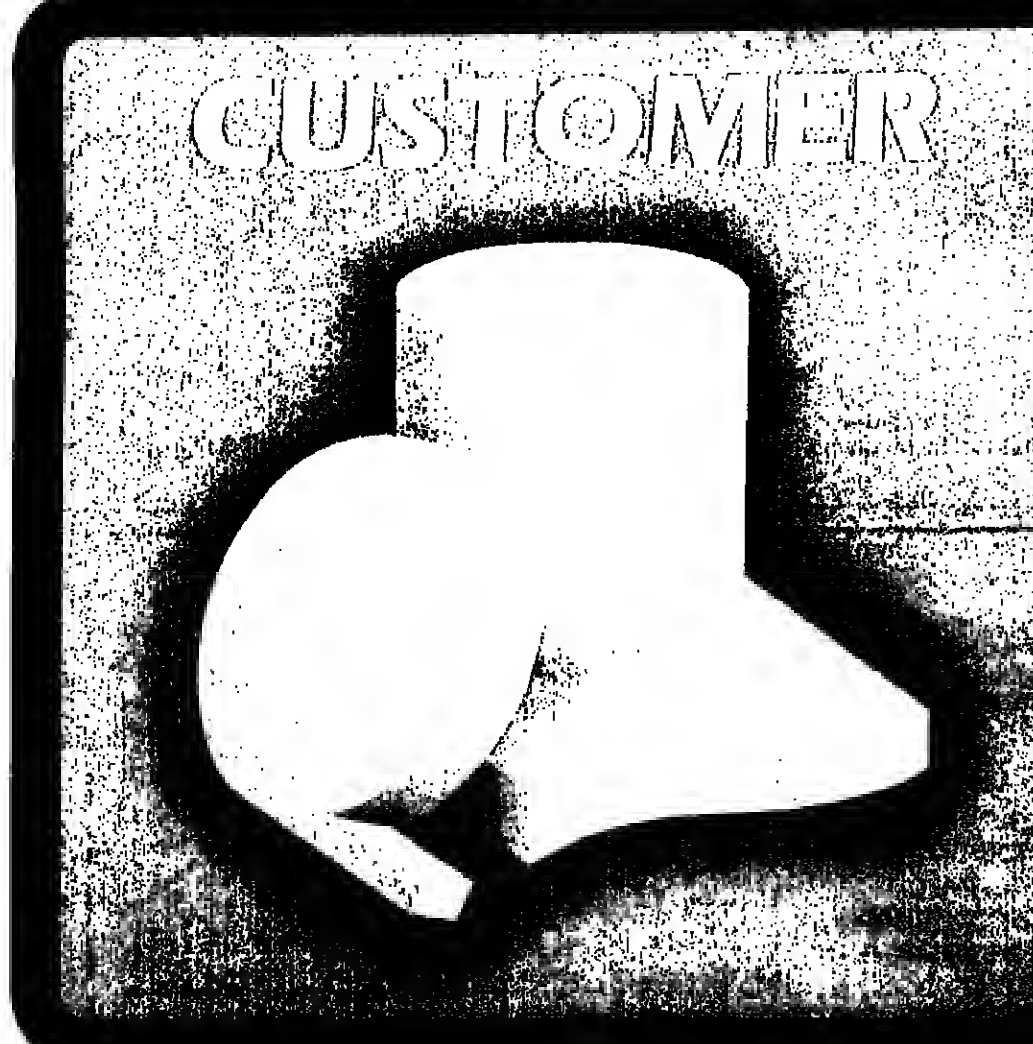
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OTHER EXPERIENCE

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All levels	UNIX and 'C'	Immediate/July/August.
	London and Home Counties	
Programmers and Consultants	Micro Assembler CP/M or MS DOS GRAPHICS	London area
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Programmers	PDP11 Basic + RSTS	London
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525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999, 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, 1019, 1021, 1023, 1025, 1027, 1029, 1031, 1033, 1035, 1037, 1039, 1041, 1043, 1045, 1047, 1049, 1051, 1053, 1055, 1057, 1059, 1061, 1063, 1065, 1067, 1069, 1071, 1073, 1075, 1077, 1079, 1081, 1083, 1085, 1087, 1089, 1091, 1093, 1095, 1097, 1099, 1101, 1103, 1105, 1107, 1109, 1111, 1113, 1115, 1117, 1119, 1121, 1123, 1125, 1127, 1129, 1131, 1133, 1135, 1137, 1139, 1141, 1143, 1145, 1147, 1149, 1151, 1153, 1155, 1157, 1159, 1161, 1163, 1165, 1167, 1169, 1171, 1173, 1175, 1177, 1179, 1181, 1183, 1185, 1187, 1189, 1191, 1193, 1195, 1197, 1199, 1201, 1203, 1205, 1207, 1209, 1211, 1213, 1215, 1217, 1219, 1221, 1223, 1225, 1227, 1229, 1231, 1233, 1235, 1237, 1239, 1241, 1243, 1245, 1247, 1249, 1251, 1253, 1255, 1257, 1259, 1261, 1263, 1265, 1267, 1269, 1271, 1273, 1275, 1277, 1279, 1281, 1283, 1285, 1287, 1289, 1291, 1293, 1295, 1297, 1299, 1301, 1303, 1305, 1307, 1309, 1311, 1313, 1315, 1317, 1319, 1321, 1323, 1325, 1327, 1329, 1331, 1333, 1335, 1337, 1339, 1341, 1343, 1345, 1347, 1349, 1351, 1353, 1355, 1357, 1359, 1361, 1363, 1365, 1367, 1369, 1371, 1373, 1375, 1377, 1379, 1381, 1383, 1385, 1387, 1389, 1391, 1393, 1395, 1397, 1399, 1401, 1403, 1405, 1407, 1409, 1411, 1413, 1415, 1417, 1419, 1421, 1423, 1425, 1427, 1429, 1431, 1433, 1435, 1437, 1439, 1441, 1443, 1445, 1447, 1449, 1451, 1453, 1455, 1457, 1459, 1461, 1463, 1465, 1467, 1469, 1471, 1473, 1475, 1477, 1479, 1481, 1483, 1485, 1487, 1489, 1491, 1493, 1495, 1497, 1499, 1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1519, 1521, 1523, 1525, 1527, 1529, 1531, 1533, 1535, 1537, 1539, 1541, 1543, 1545, 1547, 1549, 1551, 1553, 1555, 1557, 1559, 1561, 1563, 1565, 1567, 1569, 1571, 1573, 1575, 1577, 1579, 1581, 1583, 1585, 1587, 1589, 1591, 1593, 1595, 1597, 1599, 1601, 1603, 1605, 1607, 1609, 1611, 1613, 1615, 1617, 1619, 1621, 1623, 1625, 1627, 1629, 1631, 1633, 1635, 1637, 1639, 1641, 1643, 1645, 1647, 1649, 1651, 1653, 1655, 1657, 1659, 1661, 1663, 1665, 1667, 1669, 1671, 1673, 1675, 1677, 1679, 1681, 1683, 1685, 1687, 1689, 1691, 1693, 1695, 1697, 1699, 1701, 1703, 1705, 1707, 1709, 1711, 1713, 1715, 1717, 1719, 1721, 1723, 1725, 1727, 1729, 1731, 1733, 1735, 1737, 1739, 1741, 1743, 1745, 1747, 1749, 1751, 1753, 1755, 1757, 1759, 1761, 1763, 1765, 1767, 1769, 1771, 1773, 1775, 1777, 1779, 1781, 1783, 1785, 1787, 1789, 1791, 1793, 1795, 1797, 1799, 1801, 1803, 1805, 1807, 1809, 1811, 1813, 1815, 1817, 1819, 1821, 1823, 1825, 1827, 1829, 1831, 1833, 1835, 1837, 1839, 1841, 1843, 1845, 1847, 1849, 1851, 1853, 1855, 1857, 1859, 1861, 1863, 1865, 1867, 1869, 1871, 1873, 1875, 1877, 1879, 1881, 1883, 1885, 1887, 1889, 1891, 1893, 1895, 1897, 1899, 1901, 1903, 1905, 1907, 1909, 1911, 1913, 1915, 1917, 1919, 1921, 1923, 1925, 1927, 1929, 1931, 1933, 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2267, 2269, 2271, 2273, 2275, 2277, 2279, 2281, 2283, 2285, 2287, 2289, 2291, 2293, 2295, 2297, 2299, 2301, 2303, 2305, 2307, 2309, 2311, 2313, 2315, 2317, 2319, 2321, 2323, 2325, 2327, 2329, 2331, 2333, 2335, 2337, 2339, 2341, 2343, 2345, 2347, 2349, 2351, 2353, 2355, 2357, 2359, 2361, 2363, 2365, 2367, 2369, 2371, 2373, 2375, 2377, 2379, 2381, 2383, 2385, 2387, 2389, 2391, 2393, 2395, 2397, 2399, 2401, 2403, 2405, 2407, 2409, 2411, 2413, 2415, 2417, 2419, 2421, 2423, 2425, 2427, 2429, 2431, 2433, 2435, 2437, 2439, 2441, 2443, 2445, 2447, 2449, 2451, 2453, 2455, 2457, 2459, 2461, 2463, 2465, 2467, 2469, 2471, 2473, 2475, 2477, 2479, 2481, 2483, 2485, 2487, 2489, 2491, 2493, 2495, 2497, 2499, 2501, 2503, 2505, 2507, 2509, 2511, 2513, 2515, 2517, 2519, 2521, 2523, 2525, 2527, 2529, 2531, 2533, 2535, 253

Attractive careers for skilled computer people

John Charlton looks at the effects of the recession on jobs in the North

GOOD: are the days when northerners found work in mills and mines: now computer installations are among the few places offering attractive careers, but only for those who can offer relevant skills and experience.

More than most regions, the North has suffered at the hands of the current economic depression. Although the data processing industry has coped remarkably well with the problems thrown up by the current stagnation in the British economy, it has not been unaffected. And as far as job opportunities go, the market for computer staff is certainly not as buoyant as in the South.

As Brian Johns, operations manager for Tyneside software house Compower, puts it: "Firms in this area (the North-east) have been, and still are, having a hard time. Naturally this has had an adverse effect on our business, and we're not planning to recruit now or in the near future."

Another side to this picture is one that is perhaps more pleasing to data processing managers, and that is a slowdown in staff turnover.

This phenomenon is confirmed by Terence Weatherall, production manager for Leeds software house Data Science's International, who says: "We have very little staff turnover now. Two or three years ago staff were regularly

changing jobs. Now they're staying and not risking a move. No one has resigned from our operations department for over two years."

But, of course, there are jobs to be found in the North, especially if those seeking them have good skills and wide experience.

Weatherall says: "We are looking for a consultant experienced in systems design, especially in the commercial sector. He will be responsible for implementing systems, and will spearhead one of our project teams. The salary for this post is attractive but subject to negotiation."

Data Science uses an ICL 2956 running under DML.

At Spectrum Computer Services in Bradford the call is for experienced programmers, although trainees are also taken on at regular intervals.

Simeon Crowther, Spectrum's micro manager, says: "We will more than likely be recruiting some programmers in the near future. I anticipate there will be vacancies for two to three experienced Cobol programmers."

"In addition we are looking for Basic programmers to work on the microcomputer side of our business."

"We tend to recruit a couple of people every month, and we do take on Top's trainees. Most of these come from CDI (Control Data Institute) and KBS. Salaries

range from £4,000, for a junior programmer, to £14,000 for very experienced personnel."

Spectrum possesses a wide range of mini- and microcomputers, including a Nixdorf 820/35, three Commodore 8000s, and a recently acquired Hewlett-Packard mini. The bureau employs 120 staff.

On the other side of the misty Pennines, there are some attractive

In the groves of academe demand is for software people with very special skills

vacancies at the computer installation of the Greater Manchester Passenger Transport Executive (GMPTX).

Its DP manager, Bill Drynan, says: "We have openings for three systems designers and two Cobol programmers. One programmer should have two to three years' experience, the other about one year. The systems designers should have been in the DP industry for five years, and possess analysis and design experience."

"It has been a lot easier to find staff recently, certainly better than in the past. We take on about five

trainees per year, and normally we look for young people with a minimum of two A levels and the right sort of attitude and enthusiasm."

"I would say that we pay our DP staff salaries which would fall into the upper quartile of the average for this region. We like to feel that we pay better money than the average installation."

The GMPTX uses two IBM 4341s, a DEC PDP 11/70 and a DEC Vax 11/780.

Down in the groves of academe the demand is for those software people who have very special skills. The University of Manchester Regional Computer Centre (UMRCC) is a powerhouse of innovation, using some very large beasts indeed, including two CDC 7600s and a CDC Cyber 170/730.

Technical director John Clegg says: "I believe that there is a constant demand for programmers in this area. The section where we have greatest demand is for people who can write communications and network software."

"Such people can expect to be graded at a reasonably senior level and receive the appropriate remuneration."

Apart from its CDC monsters, UMRCC also has a number of ICL machines: four 7903s, one 7905 and one 1906. A fair number of operating systems are employed



There are still attractive vacancies at Greater Manchester Passenger Transport Executive, which claims to pay better than average salaries.

including the evergreen George III.

United with UMRCC in the demand for scientific software people in Manchester is Ferranti, which has two installations in Manchester, the larger located in Wythenshawe, with the other in Moston.

Richard Town, Ferranti's Manchester DP recruitment agent, says: "Ferranti is looking for software engineers. Basically, it is interested in those who have specialist skills and who have a good knowledge of various high level languages, especially those who are expert in Coral 66."

"The firm also has vacancies in Manchester for software staff who have experience of image enhancement and signal processing. Ferranti is not seeking the normal data

processing type programmer - it is more interested in those with a specifically scientific background."

"Every year the company recruits people direct from the universities via its graduate entry scheme. The number of graduates taken on varies from year to year. Ferranti takes on in particular, graduates with engineering, physics or mathematics degrees."

Naturally, most of Ferranti's Manchester hardware is of its own manufacture. Its Wythenshawe site consists of three Argus 550s, two Argus 700Es, two Argus 700s and a number of other Argus type computers. The Moston site employs the services of a Burroughs B1955.

Salaries for computer staff at Ferranti's Manchester installation range up to £14,000.

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Hotline...for an informal discussion please contact Colin Roberts, Career Development Manager, on 061-428 0771 during office hours, or write to Colin at Ferranti Computer Systems Limited, Bird Hall Lane, Cheadle Heath, Stockport SK3 0XQ.

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Telephone: 01-235 1488

THE ROYAL FREE HOSPITAL
DEPARTMENT OF CLINICAL
NEUROPHYSIOLOGY
RESEARCH ASSISTANT/PROGRAMMER
(Biological Signal Processing/Automated Diagnostics)

A computer system designed to perform automatic analysis of the Clinical Electrophysiology (CEP) is under development at the Royal Free Hospital.

Applications are invited from candidates with an interest and previous experience in Biological signal processing and/or automated diagnostics. The person appointed will be expected to assist with the routine operation of the system and also make a significant contribution to the ongoing development work.

The system is based around an HP1000 system running under RTE-10B with programs written in both HP-Assembler and FORTRAN IV. In addition Zilog MC2 120 microprocessor system is being used for some development work. Salary on scale £8,401-£10,022 per annum (London Weighting Allowance). Application form (to be returned by 24.5.83) available from the Personnel Department, Royal Free Hospital, Pond Street, Hampstead, London NW11 1TA. Tel: 0800 955 4286. Please quote ref: 0883.

HEREFORD AND WORCESTER COUNTY COUNCIL
WORCESTER TECHNICAL COLLEGE

Department of
Science and Mathematics

Applications are invited from suitably qualified persons for the following posts:

LECTURER GRADE II — COMPUTING
The person appointed will be involved in the teaching of Data Processing, Systems and Programming in a wide variety of courses in the College. The successful candidate will also be expected to assist in the development of new courses.

An ability to programme in Cobol and/or Pascal would be an advantage. Applicants must possess a degree or equivalent professional qualification preferably with commercial and/or teaching experience.

TEMPORARY LECTURER GRADE I — COMPUTING

This post will initially be of one year's duration from 1st September 1983. The person appointed will be involved in the teaching of computing to a wide range of courses including GCE 'O' level, YTS and BTEC courses.

Applicants must possess a degree or equivalent professional qualification. Salary: Lecturer Grade II £7,215-£11,808. Lecturer Grade I £5,548-£9,726. (Position on scale dependent upon qualifications and experience.) Further details and an application form can be obtained from the Principal, Worcester Technical College, Deanway, Worcester, WR1 2LP, upon receipt of a stamped, self-addressed envelope, photocopy also. (Please quote reference SH/CW).

SENIOR SALES EXECS

The Company: A major supplier of large software systems in financial, commercial and government sectors. The company has a proven track record within these markets.

The Requirement: A market achiever to sell into the above areas who must be able to demonstrate a track record of success.

Benefits: On target earnings of £30,000 plus 2 litre car.

Locations: London and Bristol.

For further information call

Chris Morrow on 01-837 0451

(daytime) or 01-267 9409

(evenings after 7.30pm).



**TOTAL
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LIMITED**
388 CITY ROAD, LONDON EC1

SENIOR IBM SYSTEMS PROGRAMMER

WEST MIDDLESEX
c. £13,500 + PAID OVERTIME

Our client, a highly successful international company, is seeking a Software Programmer with around three years' experience. Sound knowledge of MVS/JES 2 and CICS/DLI on IBM 4341 Hardware is essential whilst familiarity with VTAM/NCP would be advantageous.

The company offers continued development work within a friendly, professional department in addition to excellent working conditions, security and good benefits. These include private Medical Scheme for self and dependants, 23 days' annual leave and subsidised restaurant.

Telephone NOW: Tom Bowles

Hodge Recruitment

Bond House, 19-20 Woodstock St, London W1R 1HF 01-629 8863

SOFTWARE DEVELOPMENT GATESHEAD

Joyce-Loeb, a Vickers Company, is an acknowledged World leader in the field of Image analysis. We now wish to recruit innovative and technically competent software development engineers and programmers to join a development and applications team working on our advanced Image Analysis and Graphics Projects.

SYSTEM SOFTWARE ENGINEERS 9K-15K

The successful candidate will report to the Project Manager and be responsible for the design, development and maintenance of software packages. The mainstream of the work is systems development and some sales support and customer liaison is involved. A minimum of three years' programming experience in a scientific environment using a block structured language (preferably PASCAL) and a working knowledge of at least one machine assembly code is essential. A familiarity with the Intel 8085 microprocessor with either assembly language and/or PLM would be useful but not essential.

APPLICATIONS ENGINEERS 9K-15K

To develop applications of image analysis in medical diagnosis, industrial inspection and robotics. The successful candidate will have a proven record of scientific applications programming, and an original approach to solving problems.

PROGRAMMERS 6K-9K

The successful candidate will support the development engineers and should be familiar with a block structured language. This is an excellent opportunity for candidates with initiative, to gain experience in this exciting field of expanding technology. Training will be given where appropriate.

All applicants must possess a strong academic background in a computer related discipline which should include a numerate degree. The positions require a self-disciplined, professional approach and a willingness to contribute to a team effort is essential. An attractive salary will be offered depending upon qualifications and experience.

The company operates a favourable pension scheme and will assist in relocation where appropriate.

Applications should include a detailed c.v. and be sent to:

Mr A. Robinson
Technical Director
Joyce-Loeb (Vickers Ltd)
Marquessway
Team Valley Trading Estate
Gateshead
Tyne & Wear
NE11 0GW

**Joyce
Loeb**

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If so, we can provide you with a route to increased rewards and job satisfaction. All you have to do is contact Alasdair Scott in London or Roger Dodd in Lichfield, quoting reference WSC/053 and we will do the rest.

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29 Oxford Street,
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Cathedral House, Beacon Street,
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Apply in writing to Dal Rees, R. J. Kline and Others, Lloyd's, Lime Street, London EC3.

(4184)

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WATFORD DESIGN SERVICES LTD
212 LOWER HIGH STREET
WATFORD, Herts.
WD1 2JR

Telephone: John Case on Watford (0923) 25363

(4182)

STAFFORDSHIRE COUNTY COUNCIL Highways Department

ANALYST/ PROGRAMMER

Post No. 2201179 - Computer Section

£6,873-£9,231 (pay award pending)
Commencing salary according to age, experience and qualifications

An Analyst/Programmer is required to join the Highways Department Computer Section. The Department has 13 terminals linked to the Council's IBM 4341 computer operated under VM/CMS and also uses four microcomputers. A drum plotter is available for use.

The successful applicant will join a team of four who work on development, maintenance and user support of systems for Highway and Structural Design, Transport Planning, Accounting and Management Information. About 100 active users rely on the Section as an Information Centre.

The languages used are: FORTRAN, PL/I, APL, and BASIC, and increasing use is made of packages like ADPS, ADI and EASYTRIEVE.

Applicants should preferably be a graduate in a numerical discipline, and although experience in the area indicated would be advantageous, primary consideration will be given to a candidate able to demonstrate an interest in a wide variety of applications and ability to work with minimum supervision.

Removal expenses, lodging allowances and car user allowances may be granted in approved cases.

Application forms may be obtained from the County Surveyor, Tipping Street, Stafford ST16 2LP.

Closing date: 11th July 1983. This post is open to men and women.

All applicants are asked to note that it is the County Council's view that it is desirable for their employees to be members of an appropriate trade union.

SALES BIT

Quality of Management — 56

Incentives can reduce achievement

INCENTIVE schemes can not be considered lightly, for if they are ill-conceived they can become a negative force that actually reduces sales achievement.

Offer an incentive that is out of reach and all you will get in return is demotivation. Create an incentive with the wrong emphasis and it may have little effect on real performance and may even leave you exposed to connivance.

I am told (but I cannot vouch for the truth of it) that a major car manufacturer recently offered its dealers a £500 bonus for every car of a particular model registered within a selected period. As a result they topped the market for sales for a brief period.

Apparently the very expensive exercise had achieved their two main objectives: First, they obtained the publicity and thus the credibility for topping the sales league table. Second, and more important, they had increased the volume of car sales.

However, the word soon got about that due to the scheme being based on registrations rather than new sales to end users, most distributors had been including the registration of their own demonstrator cars in order to pick up the £500 bonus. These were not actually end user sales but rather increases of stockholding.

So the resultant figures were artificially inflated, which did nothing for the credibility of the manufacturer and not as much as was thought for actual sales.

This happened simply because nobody actually thought through all the ramifications of the scheme.

What are incentives? They are variable short-term devices for increasing sales within a selected area of sales activity for a discrete period. They are not commitments within the salesman's terms of employment like salary, commission, health insurance, pension fund and share options.

They can take a variety of forms, both financial and material, and can be put into effect at any time for any period according to the judgment of the sales manager.

Incentives can serve a variety of purposes. Sometimes they can be used to improve flagging performance. However, some sales managers will not acknowledge such a necessity for they view it as a compensation for failure on their part, to motivate adequately their subordinates.

Maybe they are right, but usually it is an unnecessary paranoia, and what does it matter anyway if the short-term incentive does the trick? After all, he is actually willing a different facet of his management skill.

Incentives are usually more effective if they are used to make a well motivated, successful salesforce even more motivated and successful. "Look you guys, you are all doing a good job and the company is pleased with your performance. Right now we need to increase the sales of this particular product in order to exploit a short-term market opportunity. This will of course involve extra work on your part, but only if you are able to cope with it, there is no compulsion. Of course, these extra demands upon you and your time must entitle you to special rewards in return. Consequently, we are introducing the following incentive scheme."

Whatever the current level of sales success it can usually be improved by the introduction of a well conceived incentive scheme, though there's not a lot of point if you already have an order backlog or a technical problem with the product. The important thing is to have a clear understanding of the ultimate objective of the exercise before even contemplating the nature of the incentive scheme.

The possibilities are endless: Launching a new product, offsetting the effect of a new product launch by your competition; increasing the number of new accounts, perhaps of a particular type; collecting overdue accounts; offsetting seasonal revenue "troughs"; reviving a flagging product.

PUZZLE ANSWER

